JULY 3, 1961

PAPER TRADE JOURNAL

Report from France—How Automatic Conveyor System Charges 8 Pulpers

"Let's Face the Facts" Currently Affecting the Paperboard Industry

Cutting Water Treatment Costs With New Chemical at Standard Packaging

Abiperm—A Workable Process for Recovery of Spent Sulphite Liquors

Contents of the Week, pages 4-5

GREATER SATISF*ACTION*
IN MARKETING **JOB LOTS!**

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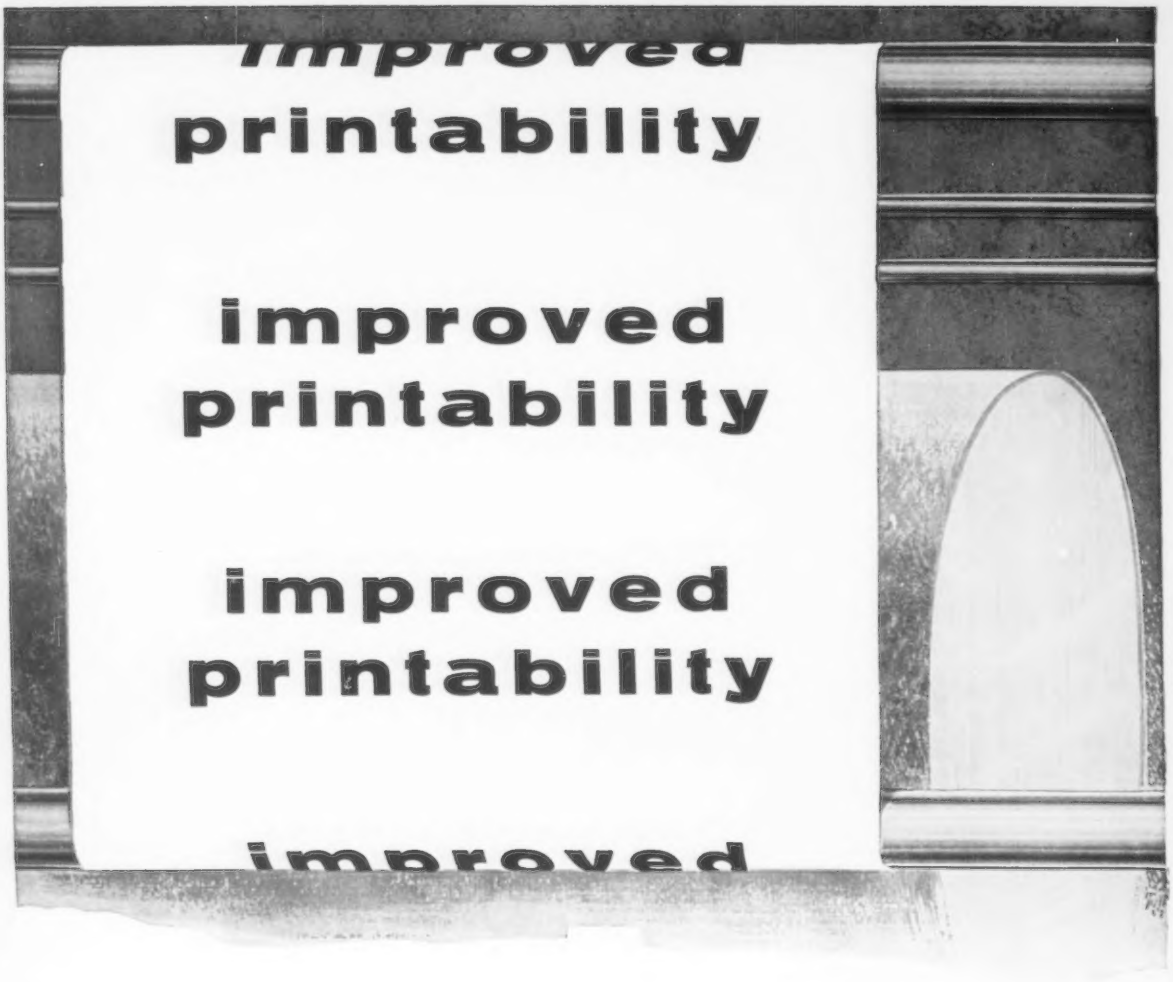

with Gelva C-3 and C-5 copolymer resins

When used as a surface size, GELVA C-3 and C-5 polyvinyl acetate copolymer resins impart a smooth finish to paper. Ink receptivity is improved. Contrast is sharply defined. When deposited from ammoniacal solution, the resin produces a water resistant film. Used in the size tub or size press, GELVA copolymer resins give improvements in wet and dry tensile and Mullen. The resins are alkali soluble. Broke recovery is quick and easy.

Write for full technical information on GELVA C-3 and C-5. Shawinigan Resins Corporation, Department 7-C, Springfield 1, Massachusetts.

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PROPERTIES

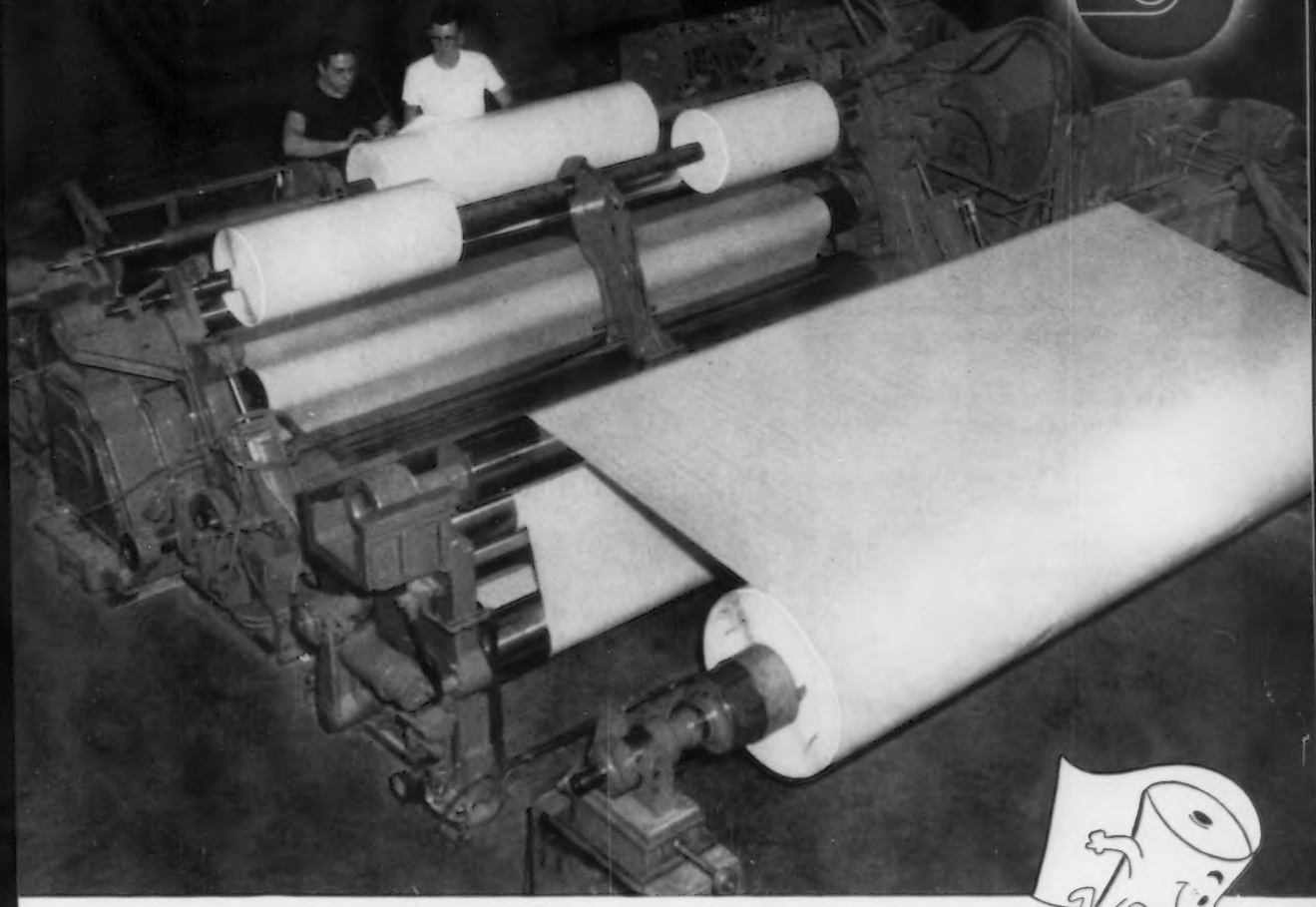
Form—Fine beads (0.2—1.0 mm. diameter)
Transparency—Excellent
Light Stability—Good
Storage Stability—Excellent

	Softening Point	Maximum Flowable Solution
C-5V-10	123°C	20%
C-3V-10	123°C	35%
C-5V-16	134°C	20%
C-3V-20	155°C	25%
C-3V-30	180°C	20%

Softening Point: Ball and Ring Method
Solution: Ammoniacal

GELVA® *polyvinyl acetate resins by* **SHAWINIGAN RESINS**

CAMERON 680 · WORLD'S LARGEST DUPLEX WINDER
A BASIC DESIGN FOR PAPER, PLASTIC FILM AND FOIL



Nicolet Paper Corp. *delivers* *the superb running qualities of* The New Roll

(IN LARGER DIAMETERS THAN EVER BEFORE)

In operation at the Nicolet mill (West De Pere, Wis.) for more than a year, the 680 has proved itself on glassines, greaseproofs and supercalendered sulphites over a range from 20 lb. to 70 lb. basis weight. The 680 has delivered 36″ diameter rolls of superb *running* quality, holding more than 13¾ miles of paper, with plenty of capacity still in reserve to meet future needs (50″ rewind diameter, 3600 fpm winding speed).

The new, large diameter roll stands up well in handling, storage and shipping. Trouble-free feeding through a long dependable run minimizes downtime due to web breaks and roll changes. It keeps the paper *fresh* and *alive* for better end results. That's why we call it The New Roll!

Like other smaller Cameron duplex systems the big 680 uses combination surface-and-center winding, applying the differential principle to allow each roll to set its own winding speed, thus compensating automatically for variations in caliper.

A variable speed hydraulic main drive, with individual speed control on each of the hydraulic rewind drives, separates control of winding speed and roll density on each set of rewinding rolls. Adjustable, pneumatically actuated, tapered automatic counterbalancing controls nip pressure separately on each set of rolls.

Among other 680 features contributing to roll quality are: the Cameron F-2 unwind and continuous duty brake; the Cameron 950 dancer roll tension system; and the hydraulic-pneumatic edge guide. All control elements are integrated, and adjustable to characteristics of the material, quality of the parent rolls, and intended use of the finished rolls.

See *before you buy*. Test-run your material on a job-fitted "pilot" system at the Cameron research and development service in Dover, New Jersey. Write today for complete information.

CAMERON

A TEAM OF SPECIALISTS

AA-397

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PAPER TRADE JOURNAL

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FEATURED THIS WEEK

Rayonier Canada Starts Up New Kraft Mill at Woodfibre, B. C.

$15 million conversion of former sulphite mill adds 250 tons per day of paper pulp to Rayonier's capacity. 15

How Push-Button Handling of Bales To Pulpers Works at French Mill

Only eight men process seven separate pulps to eight pulpers via a seemingly complicated but relatively simple and automatic conveyor system at La Chapelle—Ernest F. Barker 20

Coagulant Aid for Water Treatment Cuts Costs, Improves Quality

Investigation of a coagulation aid for reducing chemical costs of water purification brought additional benefits in a higher quality water supply to this New England mill—Earl S. Packard 25

New Ion Exchange Process for Base Recovery

A new simple process for recovery of soluble bases from sulphite waste liquor without evaporation or burning—D. F. Manchester and J. P. Termini 28

Recent Trends in Paperboard Production, Capacity and Prices

Reviewing dominant factors in this important segment of our industry, with a report on the current pick-up in demand—Alvin A. Newburg 30

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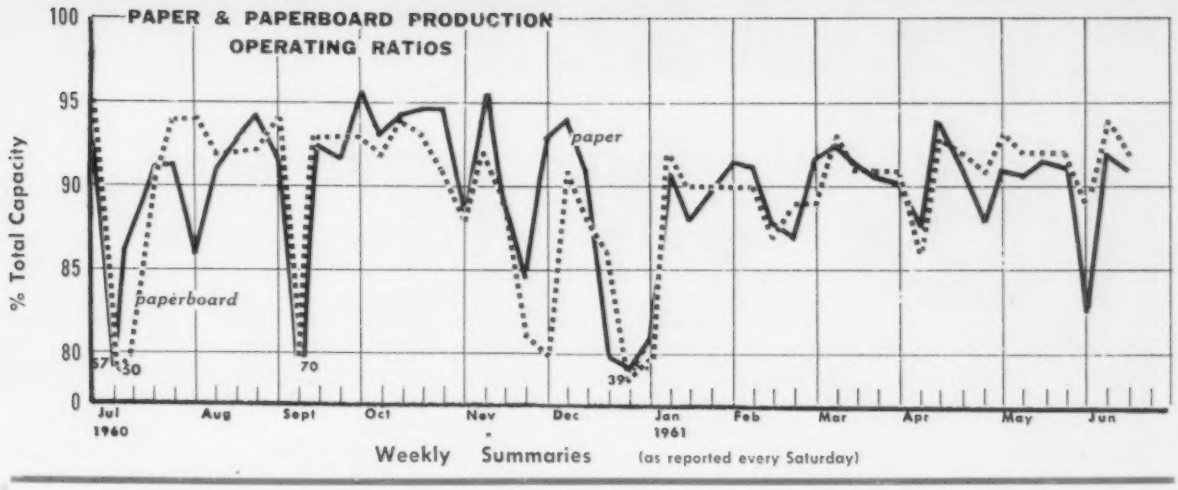

NEWS OF THE WEEK

Georgia-Pacific to Enter Bleached Kraft Market . . . Dixie Planning Tissue Plant . . . PFI Installing IMPCO Continuous Digester . . . Increased Support Planned for Miami University Program

Standard Paper Names Executive Vice President . . . Sonoco Promotes Two In Purchasing Department . . . Columbia Cellulose Names Director of Planning . . . R-W Paper Appoints New Officers . . . FPBAA Research Director to Retire .....

Side-Entering Mixers Offer 50 Per cent More Capacity . . . Same Size Lift-Truck Battery Carries More Power . . . Fractional h. p. Reducer With 25:1 Gear Ratio . . . Low Profile Pulpwood Fork Handles 16 Foot Logs . . . All Purpose End-Suction Centrifugal Pumps .....

Trends . . *9*

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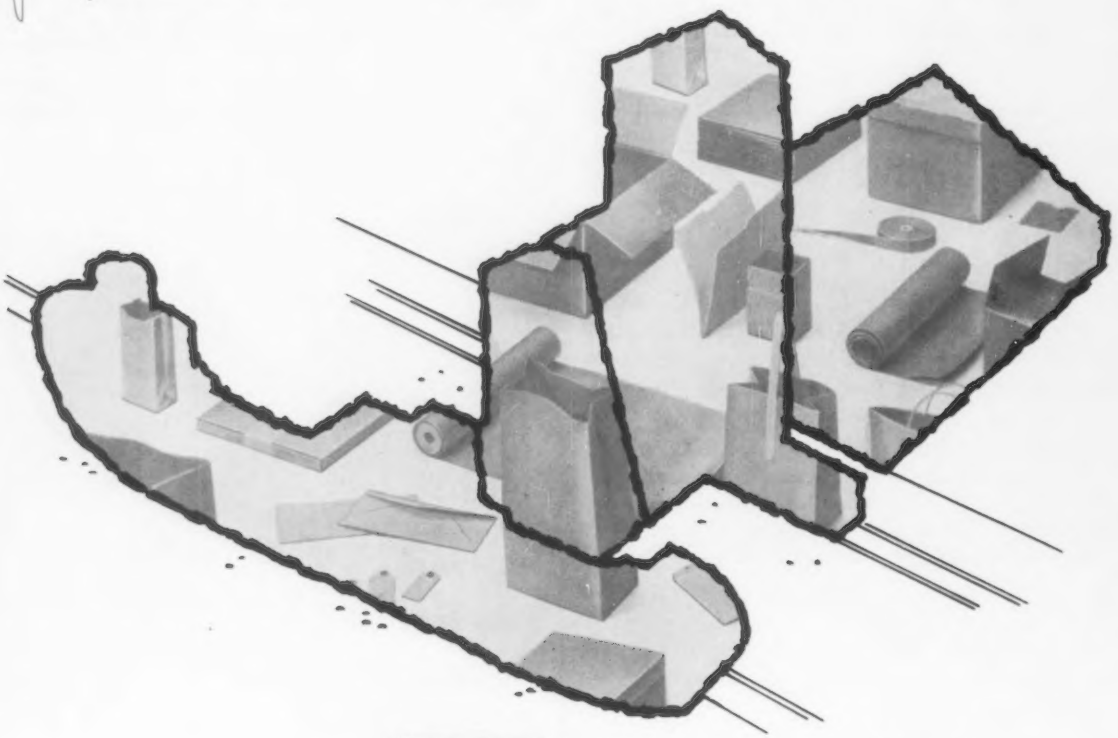
REMEMBER THESE DATES

TAPPI Lignin Symposium, Edgewater Beach Hotel, Chicago, Ill. — AUGUST 14-16

TAPPI Corrugated Containers Conference, St. Francis Hotel, San Francisco, Calif. — SEPTEMBER 6-8

WEST END

advance planning **OF SALT CAKE STORAGE DEPOT ANTICIPATES INDUSTRY'S GROWING NEEDS**



WEST END identity as a prime nationwide supplier of highest quality salt cake is underscored by Stauffer of Canada storage depot . . . the West End project that solved the problems of time and cost of other means of transportation. Customers benefit from reduced inventory requirements, lower transportation costs and prompt delivery.

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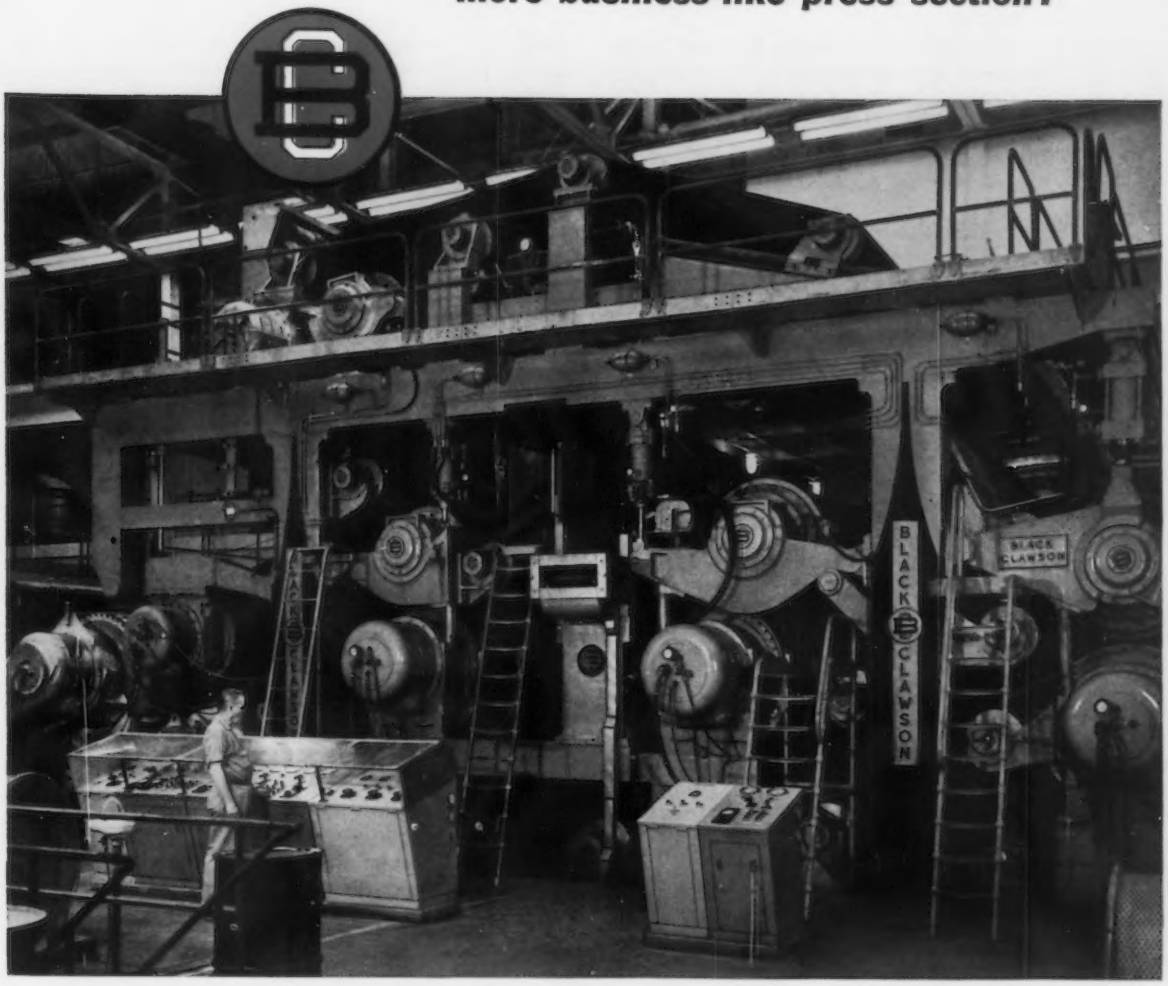
Have You Ever Seen *a cleaner,*

more business-like press section?



It's cleaner in design, uncluttered, easier to operate and maintain because it's been simplified. There's a minimum of parts. Roll removal is an easy procedure . . . so is felting, because all components are accessible.

When engineering paper machine sections, Black-Clawson strives for greater efficiency through design simplification.

The customer is always the beneficiary of advanced paper machine engineering that is based on practical understanding of the papermaker's needs.

PAPER MACHINE DIVISION
Watertown, New York
ANOTHER ADVANCED ENGINEERING DESIGN

BLACK-CLAWSON

LOOK TO POWELL VALVES

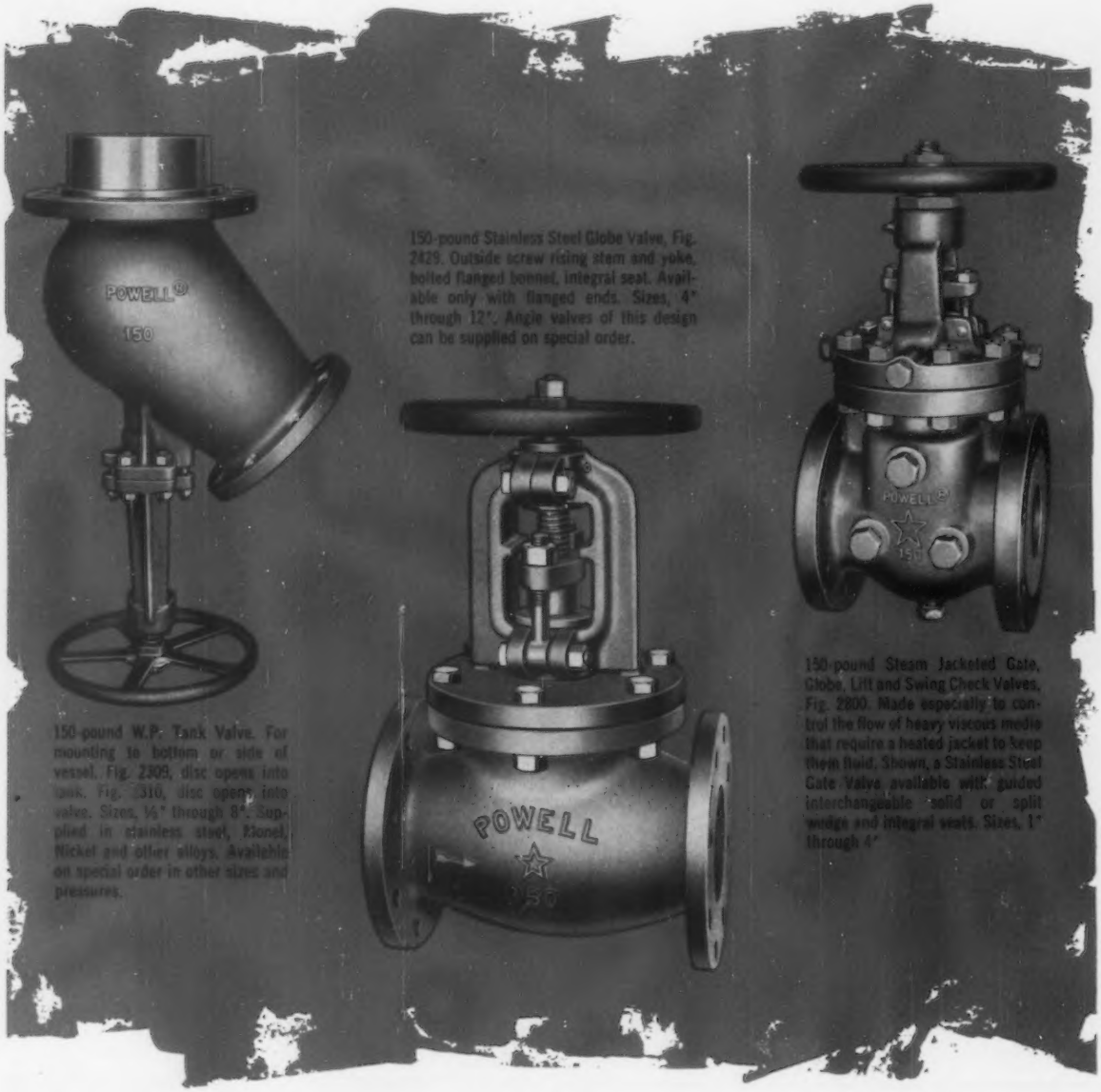
You can count on Powell Valves for the answer to virtually any flow control problem where corrosion, erosion, temperature, or pressure are encountered. Because, at Powell, you'll find the largest selection of valves for the chemical industry.

For instance, only Powell offers you such a wide selection of materials—both ferrous and non-ferrous. This includes Stainless Steel, Nickel, Monel*, Hastelloy#, Ni-resist* and aluminum, just to mention a few.

Powell Corrosion-Resistant Valves are also rated up to 2500 pounds W.P. and for temperatures up to 1000F. For complete information and the answer to your corrosion, temperature or pressure problem, contact your nearby Powell distributor or write us directly.

*Registered trade names of The International Nickel Company.

#Registered trade name of Haynes Stellite Company.



150-pound W.P. Tank Valve. For mounting to bottom or side of vessel. Fig. 2309, disc opens into tank. Fig. 2310, disc opens into valve. Sizes, ½" through 8". Supplied in stainless steel, Monel, Nickel and other alloys. Available on special order in other sizes and pressures.

150-pound Stainless Steel Globe Valve, Fig. 2429. Outside screw rising stem and yoke, bolted flanged bonnet, integral seat. Available only with flanged ends. Sizes, 4" through 12". Angle valves of this design can be supplied on special order.

150-pound Steam Jacketed Gate, Globe, Lift and Swing Check Valves. Fig. 2800. Made especially to control the flow of heavy viscous media that require a heated jacket to keep them fluid. Shown, a Stainless Steel Gate Valve available with guided interchangeable solid or split wedge and integral seats. Sizes, 1" through 4".

115th year of manufacturing industrial valves for the free world

POWELL CORROSION RESISTANT **VALVES**

THE WM. POWELL COMPANY CINCINNATI 22, OHIO

Trends

Operating Rates Hold up to Mid-June

Both paper and board mills ran close to 93% of capacity during the first half of June. During the complete month of June 1960 the operating rates were 96% for paper mills and 92% for paperboard mills.

Exports Continue Lead Over Last Year

Industry exports continue to run ahead of last year according to the latest figures from APPA. A comparison of January to April 1961 figures with those for the same period last year shows by grades and types; wood pulp +21%, paper +11%, paperboard +25%, wet machine board −7%, construction paper and board +4%, and paper and board products +33%.

Scandinavians Make Cut in European Pulp Prices

The Scandinavians cut pulp prices in the European market for the third quarter of this year. The reductions range from 3% on bleached sulphite, 2% on bleached kraft, down to 1% on unbleached sulphite. As far as we can ascertain market pulp prices will remain unchanged in the United States for the third quarter.

Price Increase for Some Wastepaper Grades

Rise in the prices of some of the coarse grades of wastepaper, as predicted here earlier, has begun. Price of old corrugated is up $3 a ton while news and mixed papers are up $2 a ton, in the Middle Atlantic States. Sustained demand by the mills in the face of short supply were responsible for the rise.

Pulp Imports Still Up— But Off in April

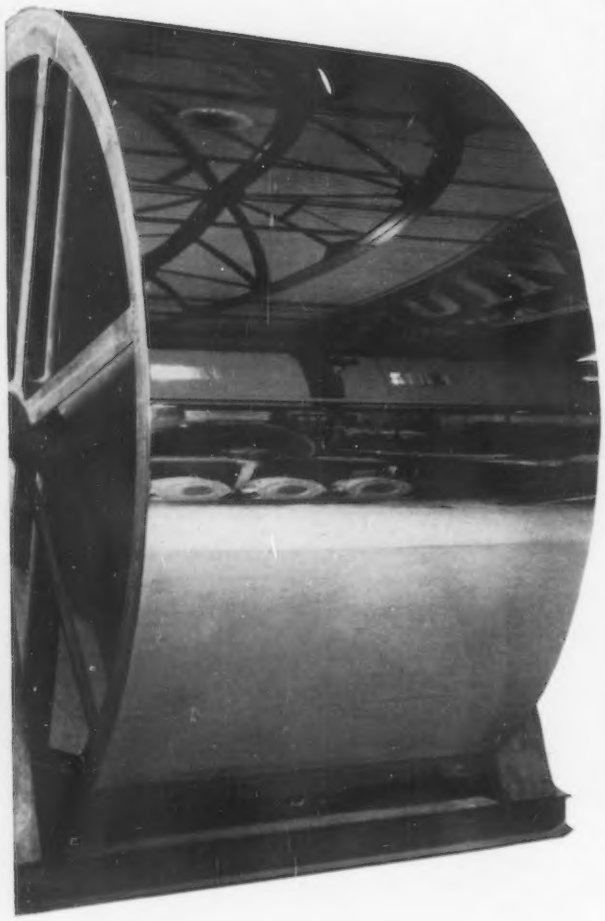
United States imports of wood pulp were off 9% in April from the same month last year, but for the first four months were up 3%. The per cent change for the four months period, this year against last, by grades are as follows (the less significant monthly comparisons are shown in brackets): bleached sulphite — paper grades +21% (+24%); bleached sulphite — non paper grades −24% (−28%); unbleached sulphite +27% (+20%); bleached kraft — paper grades +6% (−11%); semi-bleached kraft −0.6% (+9%); unbleached kraft −31% (−28%); and unbleached groundwood +33% (−13%).

Another Voice of Concern about Pricing

Recent trends in paperboard production, capacity and prices are reviewed in an extensive article in this issue beginning on page 30. Concern is expressed here by another industry leader about our price practices.

FINISH...

the prelude to PERFORMANCE



This dryer drum 12' D x 75" Face is CRODON-plated directly upon steel for hardness and durability.

The performance of your dryer drums deserves that extra fineness of best-surface-finish which vitally affects the quality of the paper you sell. There is more than simple help to be gained in your production from CRODON-plating—there is the more direct benefit of improved quality of your paper that helps your product in the market place.

For more than 30 years CRODON-plating has been applied to drum surfaces to provide operating efficiency and lowered long-range costs. These years of experience emphasize five of the benefits of the CRODON surface **finish** and its contribution to your machine **performance:**

Cleanliness	Assures freedom from rust and consequent staining.
Hardness	Gives economical long life through its durability and wear resistance.
Thermal Suitability	Provides uniform and high-performance conduction heat-transfer.
Adaptability	Enables select textured or mirror finishes tailored to product requirements.
Imprint	Fulfills a need for better finishes imparted to paper, a boost in quality for you to market.

Need this kind of help? Invite the CRODON man.

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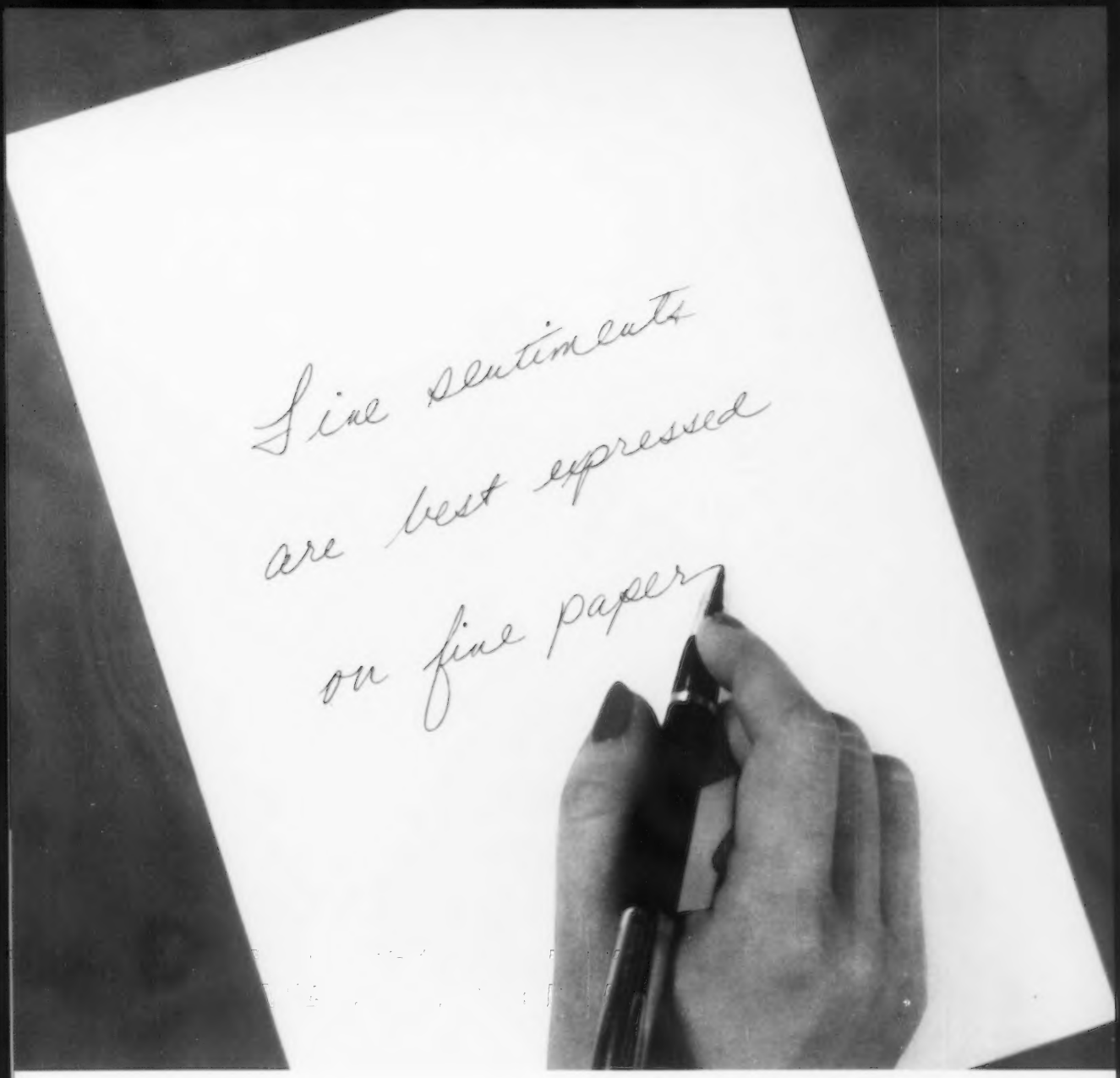

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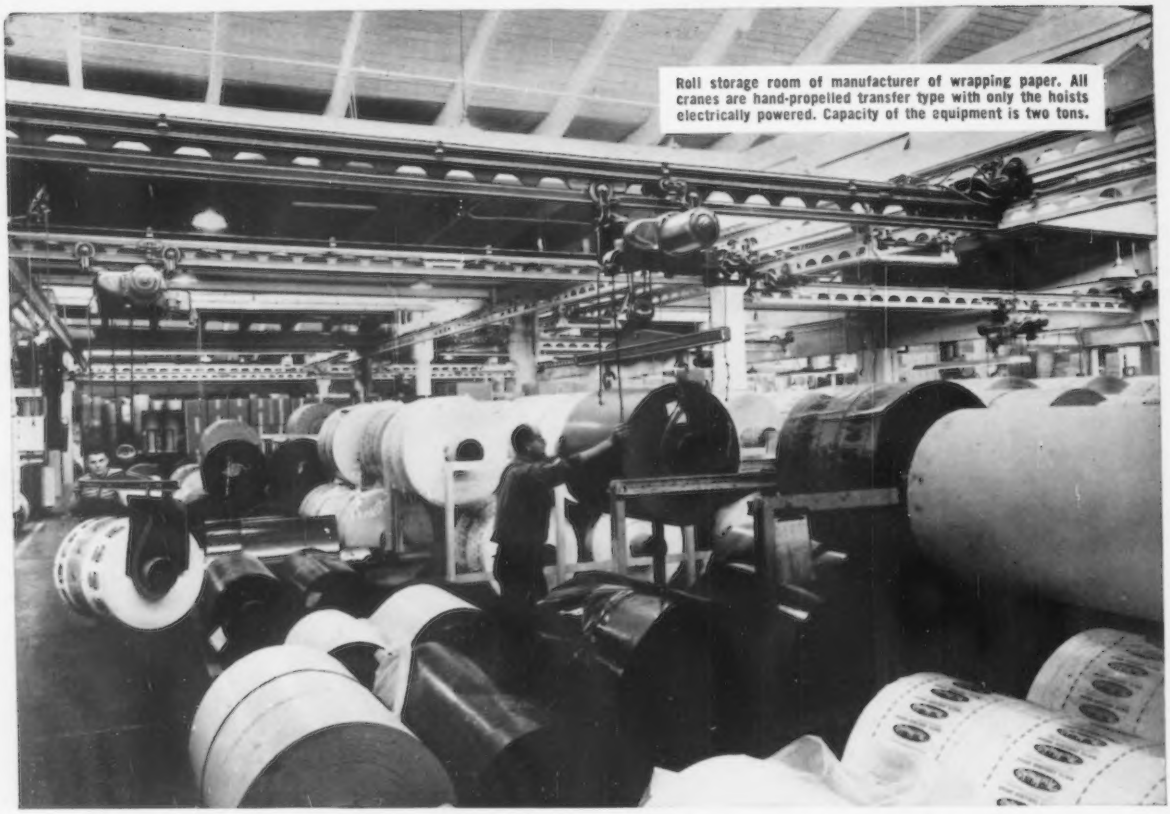


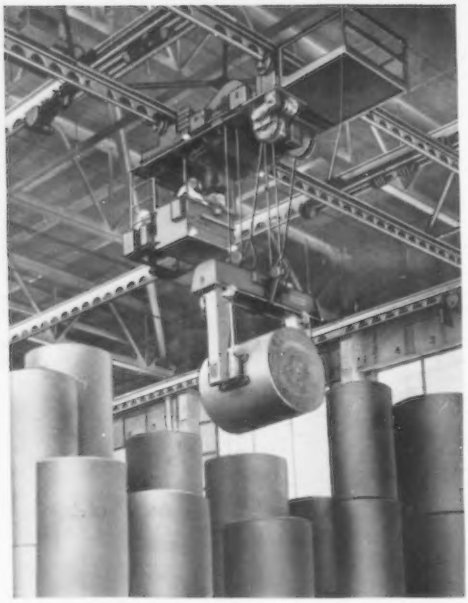
Roll storage room of manufacturer of wrapping paper. All cranes are hand-propelled transfer type with only the hoists electrically powered. Capacity of the equipment is two tons.

HANDLE and STORE ROLLS with *Easy Rolling* Tramrail Cranes

For buildings with low ceilings, Cleveland Tramrail cranes provide a solution for efficiently handling rolls into and out of storage and to printing and processing machines. Even where there are many building-support columns, these cranes can be arranged to work around them.

Because Cleveland Tramrail cranes travel so easily, requiring only 15 lbs. starting effort and 10 lbs. running effort per ton moved, one man can quickly handle rolls unassisted. When the cranes are of the transfer type, he can transfer a load from one crane to another or to a fixed track system. This enables fast direct delivery between all points served by the overhead Tramrail equipment.

When rolls are handled by the overhead route, they can be passed over floor obstacles and delays eliminated. For the same reason, it is frequently possible to reduce aisleway widths and better utilize floor space. A great added advantage, not generally considered, is the large reduction in floor wear that is brought about when heavy roll handling is transferred from the floor to overhead Tramrail tracks that are of high carbon steel and can withstand the wear.



For large roll-storage areas, Cleveland Tramrail cab-operated cranes with full-power roll grabs are unexcelled for smooth operation and handling efficiency.

The unit illustrated handles rolls to 6000 lbs., diameters to 60 inches, lengths to 120 inches and to heights of 40 ft. and more. It turns them from vertical to horizontal position or vice versa. The entire floor area is utilized. Aisleways are eliminated. Other Tramrail equipment also rotates rolls clockwise and counter-clockwise in horizontal plane.

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 7131 E. 287 ST. • WICKLIFFE, OHIO

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LOOKS WHITER AND BRIGHTER WITH

UNITANE® O-110
Titanium Dioxide

MAKES LIGHTWEIGHT PAPERS DO THE JOB OF HEAVYWEIGHTS!

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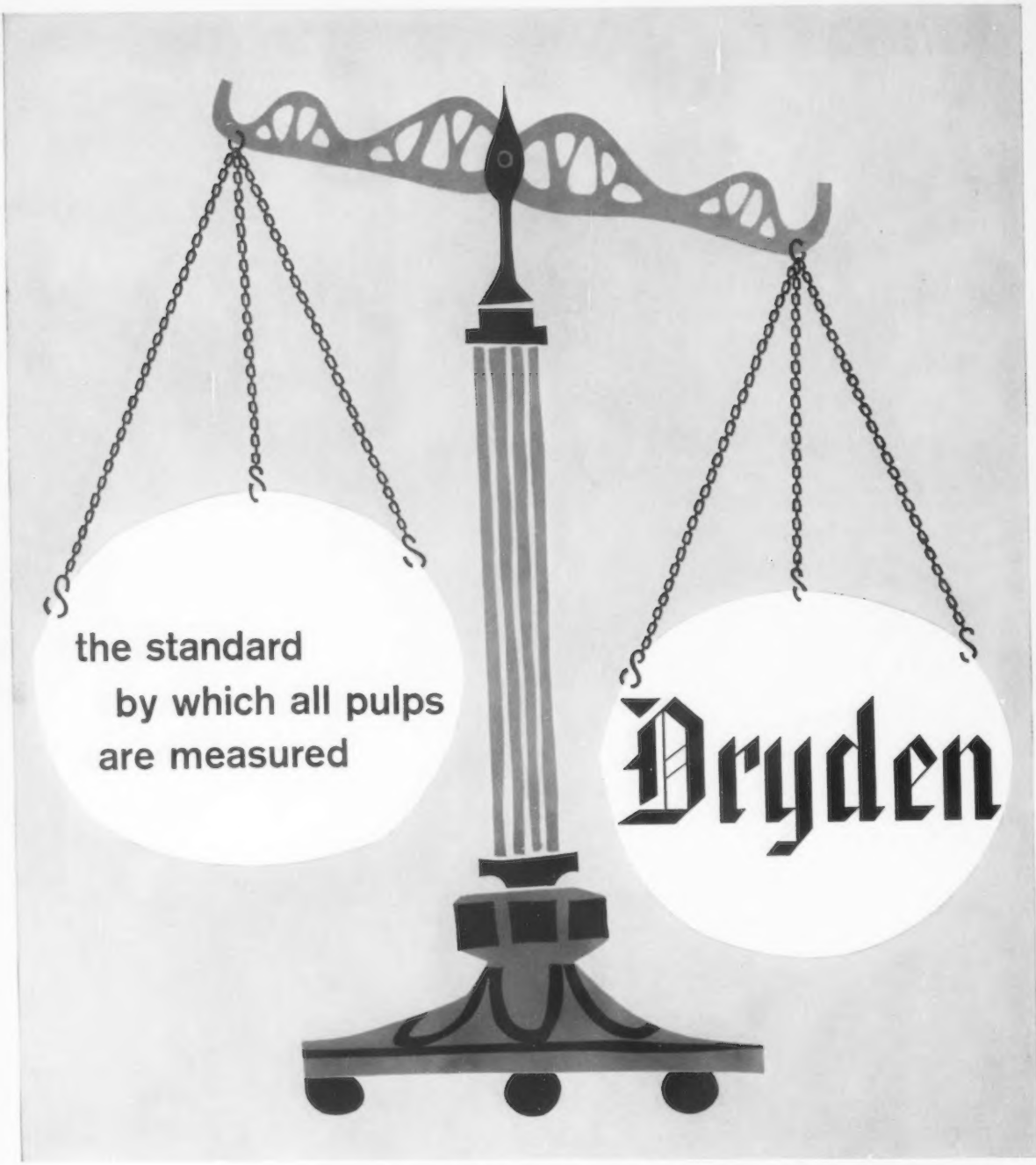

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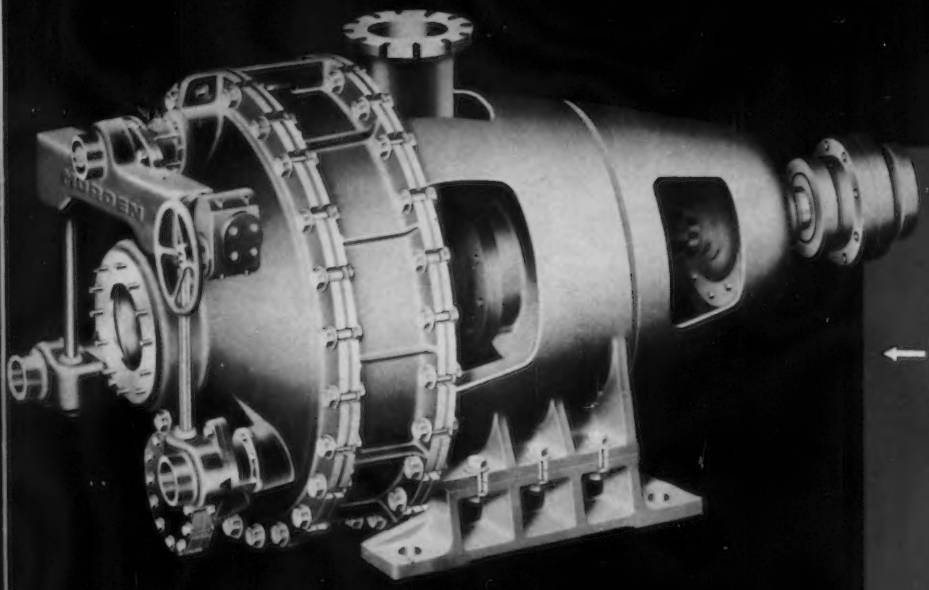


the precise
self-aligning MORDEN

DISCO·FINER

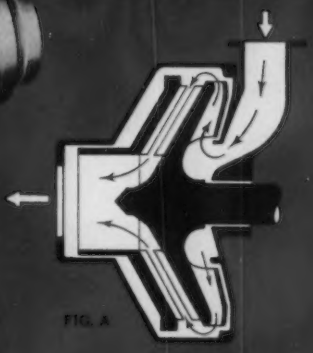


FIG. A

REVERSE FLOW
SELF-PRESSURIZING
FOR REFINING

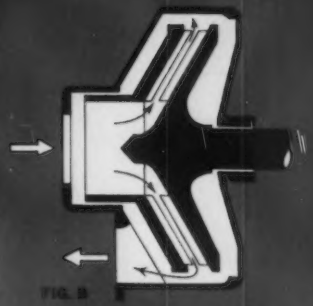


FIG. B

FREE DISCHARGE
FOR DEFIBERING

one versatile machine that provides: amazing precision • tremendous productive capacity • self-pumping, self-pressurizing • low power per ton of production • easily adapted to defiber or refine

Here is a truly significant development in stock preparation equipment. Simple flow and filling changes adapt the new DISCO-FINER so that it will either defiber or refine. The self-aligning, semi-conical design of rotor and stator plates eliminates warpage and distortion. The DISCO-FINER is designed to deliver high production without sacrifice of quality, designed to withstand many times the stresses of normal use so that precision is maintained under all conditions.

HOW THE REVOLUTIONARY MORDEN SELF-ALIGNING SYSTEM ASSURES PRECISION

In conventional flat disc design, it is difficult to maintain alignment because of shaft deflection and bearing clearances. Morden's creative engineering has overcome this disadvantage through semi-conical plate design. The Morden design assures that plates are maintained in perfect relationship to one another.

COMPARE THESE FEATURES WITH THOSE OF ANY OTHER DISC REFINER

1. High production with precision treatment.
2. Low power per ton of production.
3. 500 to 700 connected horsepower.
4. Easily adapted for defibering or refining.
   a. Reverse flow, self-pressurizing for refining. (See Fig. A above)
   b. Free discharge for defibering. (See Fig. B above)
5. Variety of plate designs and materials.
6. Precise plate adjustment.
7. Standard bearings and coupling.
8. Low maintenance.

Before you order another machine for stock preparation, see all the data on DISCO-FINER. Write for detailed information.

MORDEN
MACHINES COMPANY

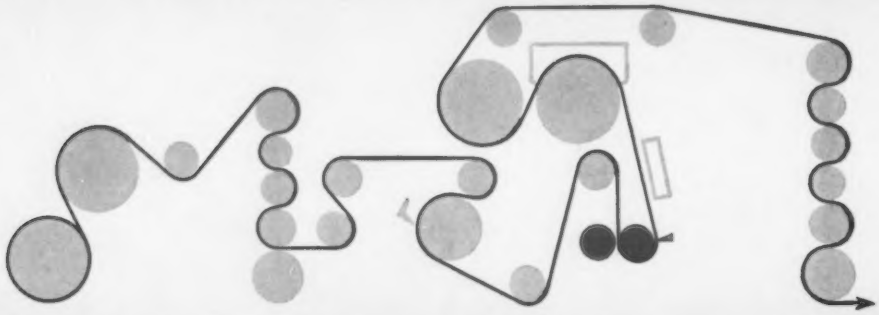
3420 S. W. MACADAM AVENUE • PORTLAND 1, OREGON

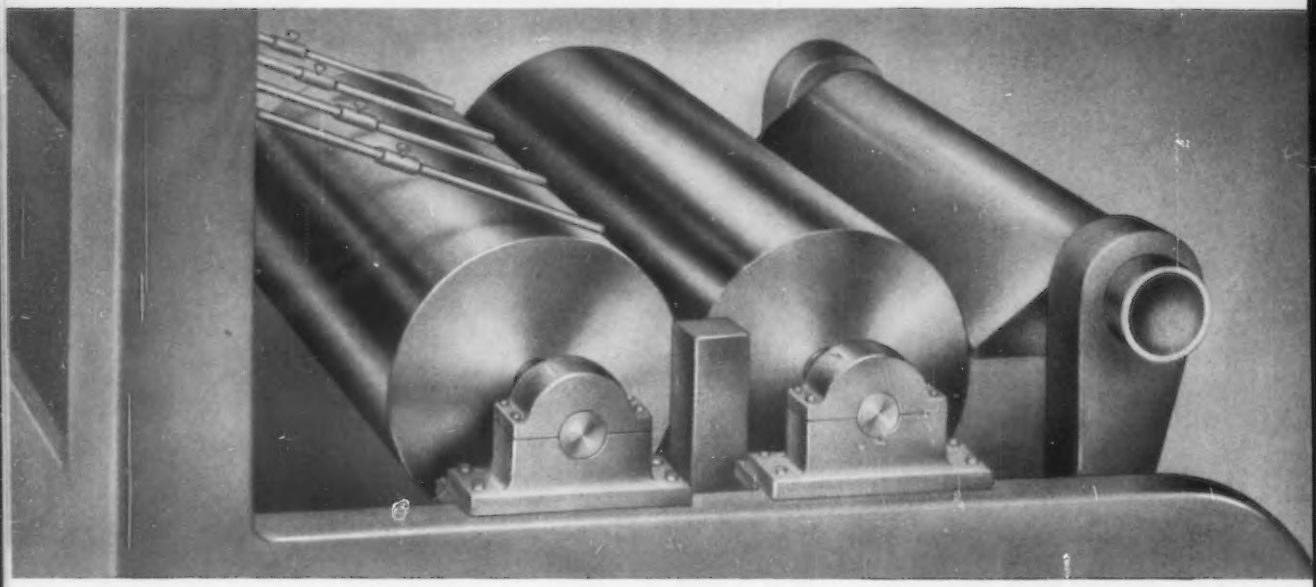
TELEPHONE: CAPITOL 2-9355 • CABLE: "MORDEN"

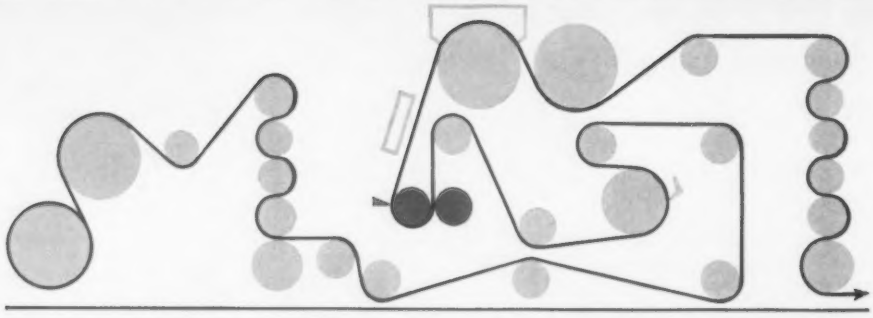
Mordenize . . .!

Send for information on Morden's complete line of pulpers, refiners and jordans . . . the standard of high quality in the industry.

NEW ROLL-AIR COATER*







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Overcomes inadequacies of existing knife coating by:

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Better double coating when combined with Rice Barton Trailing Blade Coater

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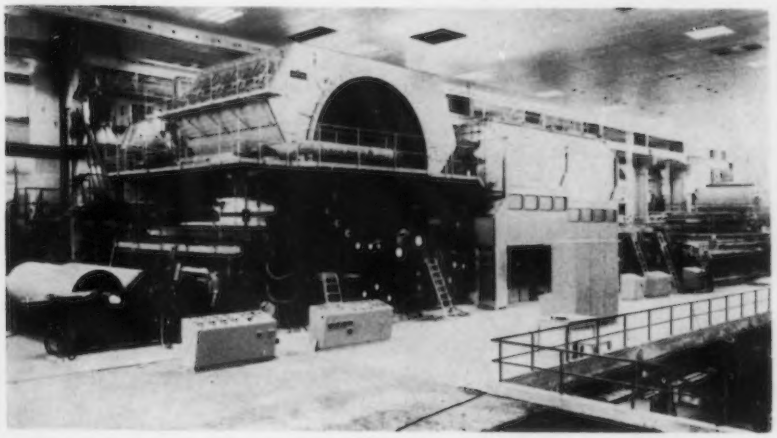
Differential Draw Control and Cone Pulley Drives • Pulping Equipment • High Velocity Air Dryers • Trailing Blade Coaters • Fibre-Flash Drying Systems

PAPER TRADE JOURNAL
WEEK OF JULY 3, 1961



NEW YANKEE MACHINE at the Fiskeby mill in Norrkoping, Sweden. Built by KMW, the new machine will produce M. G. kraft and sulphite papers at a rate of about 70 tons per day. Other projects under way at this mill include a new kraft pulp mill, a new machine for kraft sack and wrapping grades and a semi-chemical pulp mill to make corrugating medium.

Georgia-Pacific to Enter Bleached Kraft Market

Georgia-Pacific Corp. will initiate production of quality bleached kraft paper from redwood waste at a new paper mill to be constructed at Eureka-Samoa, Calif., Chairman Owen R. Cheatham announced. At the same time, Mr. Cheatham reported that recent expansions and acquisitions in the company's paper converting facilities provide coverage of the entire western market for such converted products as corrugates, folding, and set-up boxes, as well as paper tubes and cans.

In the May 26 acquisition of Royal Container Co. and Royal Fiber Corp., Georgia-Pacific acquired three operations, a converting plant to serve the San Francisco market area, a converting plant to serve the Los Angeles market area and a paper mill at Santa Clara, Calif., that will supply raw material to the converting plants.

The new Olympia, Wash., containerboard box plant, constructed by Georgia-Pacific to serve the Seattle, Tacoma and Portland market areas, has recently launched full-scale commercial production.

The success of its Toledo, Ore., paper and containerboard operation influenced Georgia-Pacific's recently announced decision to build another paper mill in the heart of the company's redwood timberlands in northern California. The new Eureka-Samoa unit will make similar integrated use of waste materials for profitable products. Redwood chips, found by company research to have outstanding properties for the manufacture of bleached kraft paper, will be delivered to the mill at practically no cost.

Substantial economies will also be effected since, presently, the redwood waste must be burnt and redwood will not burn unless it is sprayed with quantities of fuel oil making it an expensive process.

Plans for the Eureka-Samoa paper mill have been drawn, a site has been selected, and water supply has been arranged with delivery to begin in 1962. Georgia-Pacific'c plans call for initial 300 ton-per-day capacity with long range expansion to 600 to 1,000 tons as increased demand is developed. The plans incorporate possible use of two patented chemical processes to utilize further the bark from the trees as well as waste materials that result from the manufacture of paper. These processes have been under development for the past several years.

The Toledo, Ore., paper mill of Georgia-Pacific was put into operation in 1958 and its capacity was doubled to 600-plus tons per day last July.

The mill utilizes what was previously wood waste from the company's Douglas fir manufacturing operations to produce pulp, paper and containerboard from chips fed directly to the mill by pneumatic tube.

Provincial to Install New Paper Machine at Thorold

Provincial Paper has disclosed plans to install a new paper machine to increase the capacity of the company's Thorold, Ont., mill by about 25,000 tons a year.

Dixie Planning Tissue Plant

The Dixie Land and Timber Corp. has announced that it has taken an option on a 200-acre tract of river-front property in Decatur County, Ga., in the hope of establishing a tissue paper manufacturing plant.

K. Mason, president of the Atlanta-based company, revealed that the six-month option was taken on the property owned by J. Brock, a Decatur County commissioner. The site is about 4½ miles north of Bainbridge on the Flint River. Mr. Mason said engineering tests and other surveys would be made on the property.

TRUSTEES of Miami University Pulp & Paper Foundation at its annual meeting included (left to right, seated) P. S. Cade, Harding-Jones Paper Co.; C. F. Lloyd, Gardner Division, Diamond-National Corp.; H. E. Whitaker, The Mead Corp.; C. E. Brandon, Miami University paper technology program director; C. C. Fracker, representing Dwight J. Thomson, Champion Paper & Fibre Co.; (standing) B. H. Bamer, Stone Container Corp.; K. P. Geohagen, Howard Paper Mills Div., St. Regis Paper Co.; H. M. Annis, Oxford Paper Co.; William Beckett, Beckett Paper Co.; R. P. Bertschy, Kimberly-Clark Corp.; and R. W. Herr, Fox Paper Co.

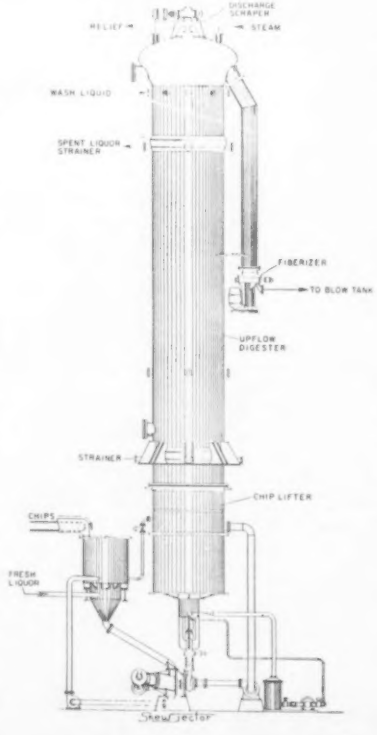
PFI Installing IMPCO Continuous Digester

The first continuous Impco vertical digester to be installed for production of kraft pulp is planned for Potlatch Forests, Inc., at Lewiston, Idaho, with a capacity of 330 air-dry tons a day. Announcement of the installation was made jointly by Vance V. Vallandigham, vice president of pulp, paper, and converting, PFI, and John Rich, president of Improved Machinery, Inc., Nashua, N. H., which developed the digester.

With the recent announcement of the IBM 1710 computer installation at Potlatch, it was noted that instrumentation of the digester will be compatible for the flow of information to the computer for improved quality control and uniformity in production of bleachable kraft pulp for folding cartons and specialty paperboard. Additionally, information recorded will assure uniform high quality and the programming of special orders.

The vertical cooking installation utilizes the Impco Chip Lifter and the Skew-Jector. The Chip Lifter is a machine for moving chips upward through the digester, while the Skew-Jector is a high-pressure feeder to handle both chips and cooking liquor without damage to the wood fibers.

Chips and liquor from the Skew-Jector are fed into the Chip Lifter, which advances chips slowly up as a compact mass. The liquor moves independently and overflows through a strainer at the top after which it is sent to the recovery plant. Cooked chips are removed from the top by a scraper to the blow tank. The pulp is delivered to the bleach plant without bleach plant modification, except that this continuous pulp process has eliminated the need for one stage of brown stock washing.



Installation is scheduled to begin September 18. PFI has assigned a team of engineers, technicians and operating personnel to devote full time to all phases of the digester and its application into the system at Lewiston.

Increased Support Planned For Miami Univ. Program

Plans for increased industry support of Ohio's first collegiate paper technology program were laid by members of the Miami University Pulp & Paper Foundation.

A meeting of representatives of the 16 member firms of the foundation came shortly after completion of the first full four-year cycle of the Miami University paper technology program, marked by recent graduation of the program's first class of seven men.

The foundation trustees approved budgeting $7,500 in scholarships for the coming year as compared to $3,600 provided by industry for the past year. This reflected both growth in the program and the fact that the scholarships are scaled to increase as the recipient advances in the program.

Chilean Firm Orders Pulp And Paper Mill Equipment

John Inglis Co. reported it has been awarded an order for about $10 million by Industries Forestales S.A. of Chile.

The contract calls for the supply of all of the machinery and equipment for a pulp and paper mill of a rated yearly capacity of 60,000 tons of newsprint. Forestales is located at Naciemiento in south central Chile.

Stone Container Moves Its Chicago Headquarters

Stone Container Corp., Chicago, has announced the move of its corporate headquarters to 360 N. Michigan Ave., from 4200 W. 42nd Place. The London Guarantee & Accident Building has been officially re-named the Stone Container Building.

Housed in the new quarters are Stone's corporate management group, including departments handling industrial relations, corporate accounting, credit, paperboard sales, national paperbox sales, national corrugated sales, market research, advertising, public relations and product development.

Correction

In our June 19 issue two of the graphs used to illustrate the article, "How to Identify Pulp Types in Felt Plugging," on pages 30 and 31 are misplaced. The graphs for Figures 1 and 3 should be interchanged. Also, the second line of the caption for Figure 2 should read—"Absence of absorption band at 6.6 microns is shown."

Badger Paper Plans To Add Two Buildings

Badger Paper Mills, Inc., has announced an expansion program that includes plans for two new buildings at its plant at Peshtigo, Wis.

The first building will be a one story, 1,872-square-foot structure at the pulp mill to provide additional space for the engineering department and other technical personnel.

The other building will house a chlorinating tower and equipment for the company's continuous bleached sulphite pulp system. Cost of the two buildings was not announced.

Marathon Constructing Pilot Plant at Neenah

Construction of a pilot plant that will enable the Marathon Division of American Can Co. to consolidate long-range, developmental manufacturing activities has been started.

To occupy 38,000 square feet of working floor space, the building will house laboratories and small-scale machinery that is employed to develop new products and production processes, as well as to improve existing manufacturing methods. Pilot equipment will include woodpulp digesters, a paper machine, coaters, plastic extruders and printing presses.

Designed and planned by Marathon engineers, who will supervise construction, the new pilot plant is scheduled to be ready for occupancy by the end of this year. The building will be of steel and concrete block construction that will be faced with brick veneer on three sides. It will be located in the southwest section of Neenah at a point between Marathon's General Office Building and its Neenah plant.

Paper and Paperboard Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending June 17, 1961, at 91.0 per cent, compared with 92.6 per cent, revised, for the preceding week. The ratio was 100.0 per cent for the corresponding week a year ago.

The National Paperboard Association reported the paperboard production ratio for the week ending June 17, 1961, at 92 per cent, compared with 94 per cent for the preceding week and 93 per cent for the corresponding week a year ago.

(Detailed Statistics on page 44)

Rayonier Canada Starts Up New Kraft Mill at Woodfibre, B.C.

$15 million conversion of former sulphite mill adds 250 tons per day of paper pulp to Rayonier's capacity.

The new kraft papermaking pulp mill of Rayonier Canada, Ltd., commenced operations at Woodfibre, B. C., in late June. Located on Howe Sound, 35 miles north of Vancouver, B. C., the mill will produce 250 tons a day of new, high quality bleached kraft pulps specifically designed for papermaking. Provision has been made for possible future expansion and the mill's built-in flexibility is said to assure an unusually broad range of pulps.

First product to be manufactured is the new papermaking pulp, "Fibrenier," a versatile pulp formed from a new blend of western hemlock, western red cedar and Douglas fir. It was specifically designed to yield high properties of strength, formation, brightness and opacity to fine papers. The company said that "Fibrenier" is but the first of an entire new series of papermaking pulps which will emerge from the new mill. Several are now in final development or testing stages and will be formally announced after trial production runs have been accomplished at Woodfibre.

Detail engineering for the new mill was handled by the Vancouver firm of Sandwell and Co. working closely with Rayonier and Rayonier's central engineering divisions.

Conversion Problems

The Woodfibre mill produced unbleached sulphite pulp during its earlier days, that is, from 1912 to 1938. In the latter year a bleach plant was added and thereafter the primary product was dissolving grade bleached sulphite pulp. The 1961 conversion program entailed abandon-

ment of such existing equipment as was suitable only for production of sulphite pulp and the installation of facilities for producing bleached kraft.

Space is limited at Woodfibre as the site is on a relatively small, more or less level area, bounded by water on one side and by steep slopes on the other sides. Accordingly, careful planning was required to make effective use of the available ground area and of existing buildings but at the same time to provide a sound, practical arrangement of equipment. This planning too had to allow for not only the initial production of 250 tons of pulp daily but for increasing the production to twice this amount at a later date.

The Woodfibre mill has an adequate water system which required only minor modification and replacement of some piping.

The steam power plant, built in 1947, has one 100,000 lbs. per hour oil-fired boiler and two 100,000 lbs. per hour oil and hog fuel fired. One of these two has been modernized by equipping it with a Riley pneumatic spreader stoker and by some modification of the heating surface to give improved continuity of operation. If this conversion proves satisfactory, the second wood fired boiler will be similarly converted in the near future.

The 1947 electric power plant has two 2,000 kw. Elliott back pressure single extraction turbo-generators and a 2250 kw. generator, driven by a Pelton wheel. These generators were formerly supplemented by a 1917 vintage 2,000 kw., 175 p.s.i. condensing turbine for emergency use. This has been discarded and in its place there is now a Canadian General Electric 3750 k.v.a. generator driven by a 3300 kw., 550 p.s.i., 725°F. condensing turbine. This is the largest condensing steam turbo-generator ever built in Canada.

By careful planning it was found possible to provide an adequate electrical distribution system by adding only one new power transformer.

Chemical Recovery

Recovery of the digester liquor fuel value and chemical content is accomplished in a 570 p.s.i. 725°F. Babcock Wilcox & Goldie McCulloch recovery boiler designed to burn 855,000 lbs. dry solids per 24 hours. The venturi scrubber, cyclone evaporator and all principal auxiliary equipment were furnished and installed by Babcock Wilcox & Goldie McCulloch. The recovery boiler draft fans, venturi pumps and feed pump are equipped with Canadian Westinghouse back pressure steam turbine drives.

A 9 ft. diameter by 175 ft. Traylor kiln with Peabody scrubber and recausticizing equipment furnished and installed by Eimco Process of Canada, Ltd., are in the area formerly occupied by the sulphite acid plant. Eimco also furnished the lime mud filter. Carrier vibrating conveyors by United Steel Corp., Ltd., handle makeup pebble lime rock and burned lime from the kiln.

About half of the requirements of chips and hogged fuel will be delivered by barge from Rayonier's Marpole and New Westminster sawmills. Existing woodroom at Woodfibre will furnish the other half. Chips are stored in three existing concrete silos supplemented by an open storage area. A Rader pneumatic system will transfer the chips to or from the storage pile. Unloading from the barges will be accomplished by means of a Colby double hammer-head grab bucket unloader. This has been erected on a new wharf 340 feet long on which also are the belt conveyors to receive the chips and hogged fuel from the unloader. The Horton black liquor evaporator has four effects and has a surface condenser to give maximum heat recovery.

Cooking and Washing

Five 12 ft. by 55 ft. Dominion Bridge digesters and the foundation for a sixth one have been provided. They are fabricated from Lukens stainless clad steel. These digesters are installed in the original digester building in the area formerly occupied by three 18 ft. by 45 ft. sulphite digesters of German manufacture. Two of these were in use from 1912 to 1958. Number three was installed in 1914. The useful lives of these old vessels, however, are not yet over as they will now serve as filtrate tanks for the brown stock washers. For this purpose they were moved bodily out of the digester building by tipping them over bottom end first and passing them out through suitable openings cut in the building wall.

Two 18 foot sulphite digesters remain in the digester building for use as white liquor storage tanks in the new operation.

An entirely new steel-frame building with asbestos-cement siding adjoins the digester building. In this are installed a Sherbrooke centrifugal knotter, three Sherbrooke 8 ft. by 16 ft. washers, two Cowan unbleached primary screens, one tailings screen, the Sherbrooke 6 ft.-6 in. by 14 ft. unbleached decker and a bleached decker of the same size. There also are a Cowan bleached screen and a battery of Centricleaners moved from the abandoned former bleached screen room.

New Bleach Plant

Practically all bleaching equipment is new. By careful planning it was found possible to house this equipment in the existing bleach plant concrete structure built in 1937.

A six stage continuous bleaching sequence is provided including chlorination, hypo-chlorite bleaching, caustic extraction and chlorine dioxide. There are five new 8 ft. by 12 ft. Dorr-Oliver-Long vacuum washers with Chemical Linings Co. tile vats. Three stages utilize existing batch reactors which were converted to down flow towers by modifying them and equipping them with Sherbrooke circulators and dilution nozzles.

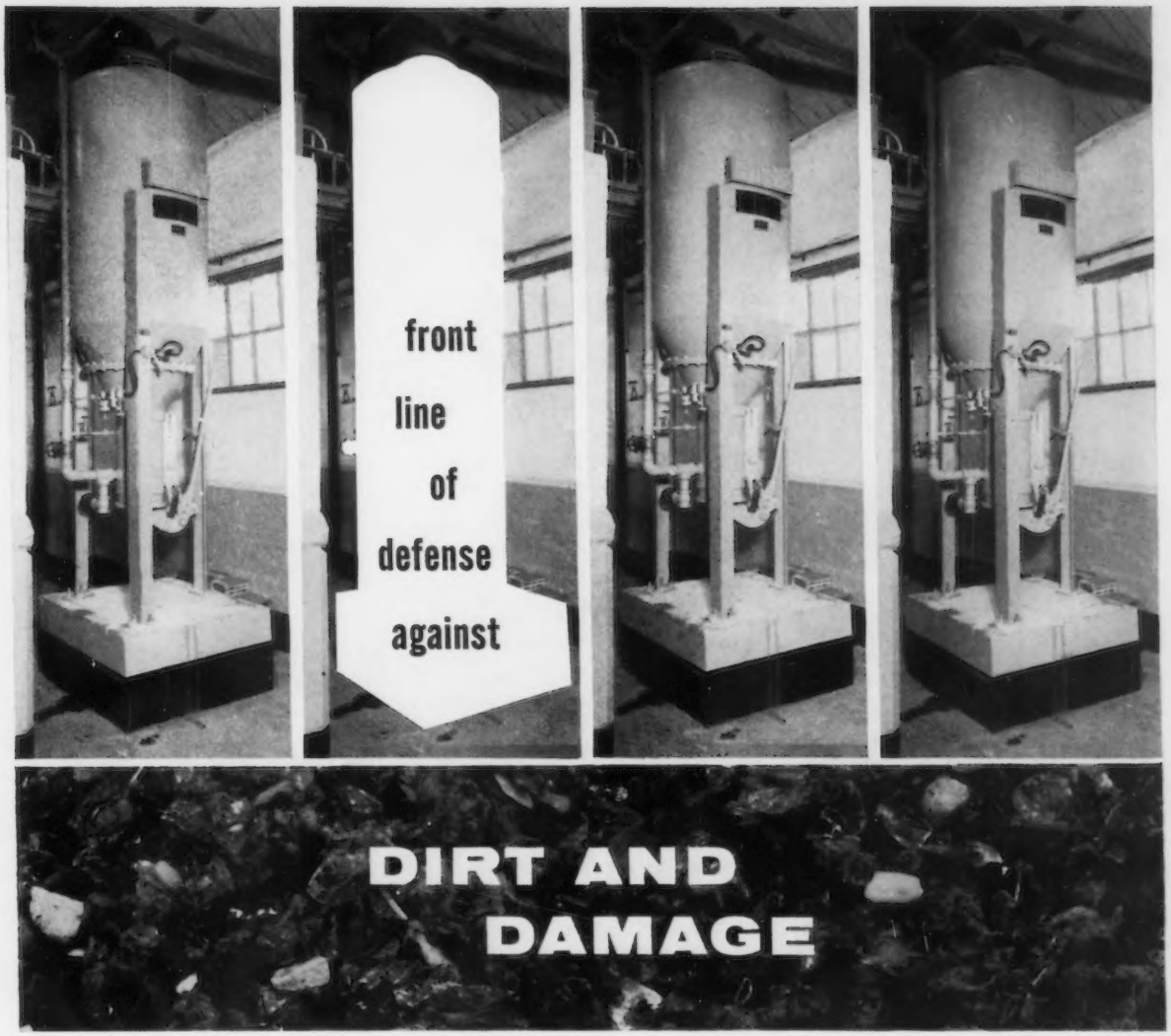
The chlorine dioxide towers are the Sherbrooke up-flow, down-flow type. These were fabricated and erected by Pacific Steel Erectors and lined by Chemical Linings Co. Four Sherbrooke thick stock pumps, four Dorr-Oliver-Long steam mixers and two Paper Machinery, Ltd., horizontal chlorine dioxide stock mixers are incorporated in the bleach plant arrangement.

Chlorine dioxide is manufactured in a generating plant located at operating floor level. The main components of this plant were designed and furnished by Electric Reduction Co. of Canada. Calcium hypochlorite bleach liquor is produced in a fully automatic continuous plant located on the bleach plant operating floor. This equipment initially will be furnished lime slurry from the existing batch plant utilizing purchased burned lime. In the near future, however, it is expected that burned lime from the main kiln will replace this.

Pulp Drying and Baling

The old pulp drying machines will continue in use for the time being. One of these is of German manufacture and dates from 1912 when the original mill was built. The other machine was built by the Black Clawson Co. in 1917.

The bale make-up and handling equipment will be improved by replacing the hand operation with semi-automatic equipment which is being furnished by the Cranston Machinery Co., Inc. Tennant automatic bale tying machines also are being installed.



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PAPER PEOPLE

G. S. Johnston, Jr.

Standard Paper Names Executive Vice President

Standard Paper Manufacturing Co. of Richmond, Va., has announced promotion of George S. Johnston, Jr., from vice president to executive vice president, and election of Mr. Johnston and Joseph E. Hoffmann, vice president and sales manager, to the board of directors.

Mr. Johnston joined the company in February of this year as vice president and assistant to the president, Howard S. Donald. Before coming to Standard, Mr. Johnston was a member of the management staff in New York of W. R. Grace & Co., Latin American Paper Division, assigned to company operations in Cuba, Puerto Rico, Mexico and Colombia. He served for a time as resident plant manager in Havana. From 1952 to 1959, Mr. Johnston was with the Continental Can Co. where he was first plant manager, paper container division, and later manager of bleached board development. Prior to his association with Continental, Mr. Johnston served in management capacities with Champion Paper and Fibre Co., Hamilton Division.

Mr. Hoffmann came to Standard in 1938. He was in charge of sales in the New York area for 14 years prior to May 1, 1960, when he was appointed vice president and general sales manager. Mr. Hoffmann makes his headquarters in New York City.

Riegel Appoints Pulp Sales Manager in Chicago

The appointment of Marcus T. Reynolds as midwestern regional pulp sales manager in Chicago has been announced by Riegel Paper Corp.

Sonoco Promotes Two In Purchasing Department

Two promotions in the purchasing department of Sonoco Products Co. have been announced by P. C. Coggeshall, vice president—administration.

J. B. Boyd, purchasing agent, has been promoted to director of purchases. P. M. Stanley, assistant purchasing agent, has been named to succeed Mr. Boyd.

Mr. Boyd joined Sonoco in 1940 and worked in one of the manufacturing departments until 1941 when he was transferred to the production department as a cost estimator. He became assistant purchasing agent in 1946, and in 1953 was promoted to purchasing agent.

As director of purchases, Mr. Boyd will have responsibility for the general supervision and coordination of the purchasing activities of the company including branch plants.

F. E. Hertha

Columbia Cellulose Names Director of Planning

F. E. Hertha has been appointed director of planning for Columbia Cellulose Co., Ltd., and its subsidiaries. He joined the company in 1957, working two years as financial analyst at the Prince Rupert pulp mill before being transferred to the head office in Vancouver.

In his present capacity, Mr. Hertha acts as chairman of the Development Committee for Columbia Cellulose Co., Ltd., and assists in the financial analysis of all major projects.

Hand Joins Westvaco Bleached Board Division

Jess H. Hand has been appointed as technical sales-service engineer with West Virginia Pulp and Paper's

(Continued on page 19)

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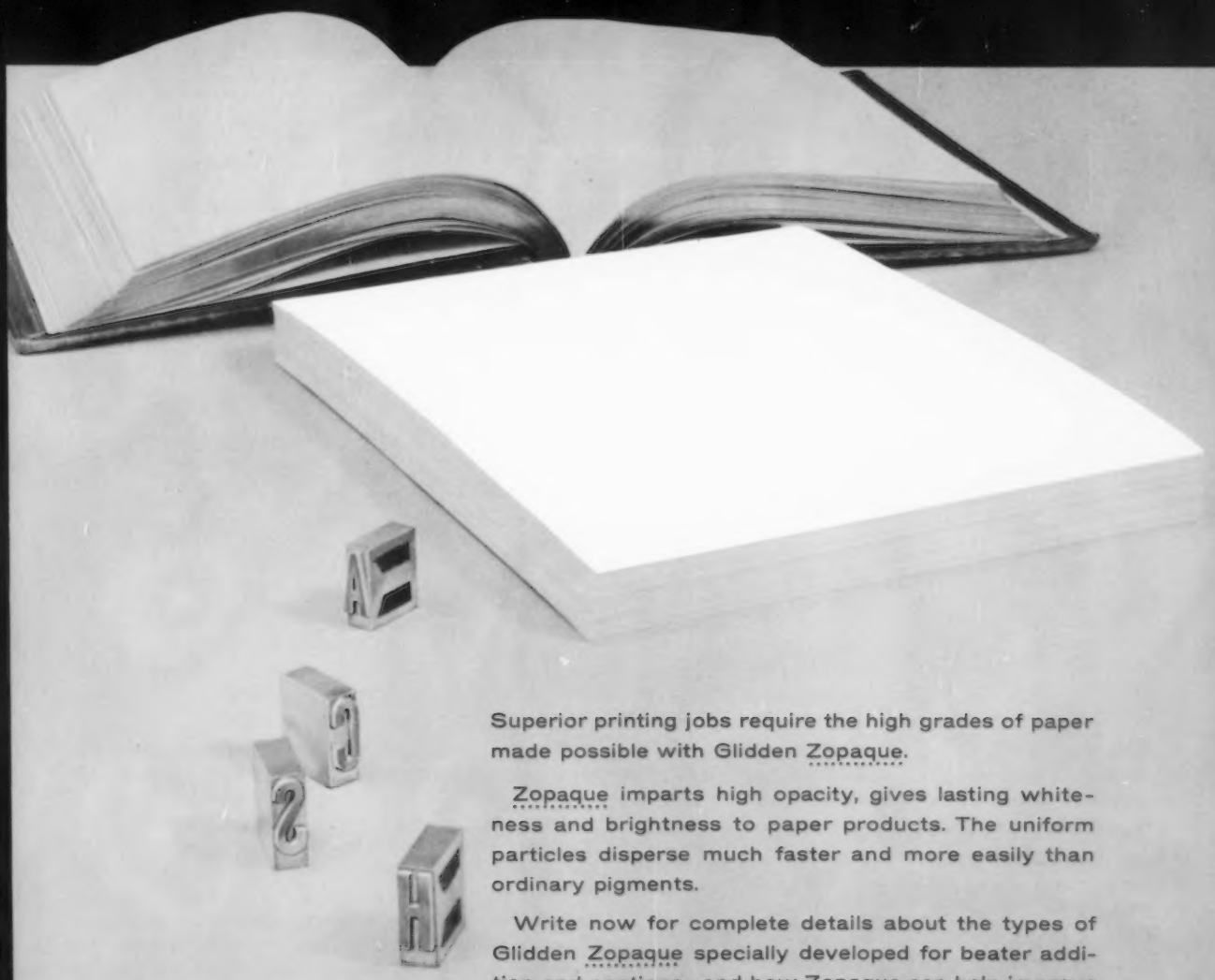

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How to keep inventory down — and how to have the best paper machine felts on hand when needed without desperation orders or costly delays?

Now you can solve both these problems with ALBANY FELT COMPANY'S **Standing Order Plan!** The solution is as near as your Albany Felt Sales Engineer — or your telephone.

Under the **Standing Order Plan,** Albany Felt Company is authorized to ship a specified number of felts — made just for you — at regularly scheduled intervals, based on your anticipated needs. No reorders are necessary for the duration of the agreement.

Albany Felt then schedules manufacture of your felts in time to make certain that shipment dates are met. Since felts to meet your specific requirements are always in process for your future needs, you are constantly protected. Yet, the **Standing Order Plan** is flexible enough to allow for adjustment of inventory by revision of shipping dates.

If you should have an emergency, Albany Felt Company is then in a better position to quickly provide extra felts. On the other hand, if your stockpile should grow, a shipment can be delayed or omitted. Your only responsibility is for felts already woven; this number is small and agreed upon in advance.

Knowing of the protection this plan affords, you can safely reduce the felts carried in your inventory. This reduces storage space requirements and frees funds for other purposes. In addition it saves worry, paper work and possible down-time.

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UFORMITE

PAPER PEOPLE

(Continued from page 18)

Bleached Board Division in Covington, Va. He replaces Nelson E. Zinn who has been promoted.

Mr. Hand has broad experience in printing production and carton making. His most recent position was general printing foreman with Mead Packaging, Inc., Atlanta, Ga. Previously, he held the post of gravure foreman with the same company. His background includes administrative and production experience with National Color Printing Co., U. S. Printing & Lithographing Co., and Burgess Color Co. where he supervised the installation and initial production runs of modern gravure presses.

Andrews to Retire from Brown Vice Presidency

Robert W. Andrews, a vice president of Brown Co. since February 1954, will retire October 17, according to an announcement by Leonard A. Pierce, president of the northern New England forest products firm. The retirement is in accordance with Brown Co.'s mandatory retirement policy, Mr. Pierce said.

Mr. Andrews joined Brown as assistant to the president in March 1952 and became works manager in July of that year. A graduate civil and mechanical engineer, he has filled a number of responsible positions both in production and in connection with capital building programs of the company.

Mr. Andrews' most recent assignment has been supervision of construction and operation of the company's new Bermico plant in Birmingham, Ala., the country's most modern fiber pipe and conduit plant.

Prior to joining Brown, Mr. Andrews served as chief engineer, executive vice president and senior vice president of Minnesota and Ontario Paper Co. He is a graduate of the University of Maine.

Nat'l Vulcanized Fibre Adds to Research Staff

National Vulcanized Fibre Co., Wilmington, Del., has added two research and development laboratories in Yorklyn, Del.

They are Dwight B. Easy of Kennett Square, a paper chemist, and Harold A. Wilson, a development engineer. Mr. Wilson formerly was head of research and development for the Homalite Co.

R. E. Harper

H. A. Hayward

R-W Paper Appoints New Officers

G. E. Rouse

R-W Paper Co., Longview, Wash., manufacturer of glassine and greaseproof packaging papers, announces that Robert E. Harper, general manager, has been elected vice president-general manager; Harry A. Hayward moves up from sales manager to vice president — sales; and Gareth E. Rouse from assistant treasurer to treasurer. Prior to joining R-W, Mr. Harper was with the Rhinelander Paper Co. from 1932 to 1955, having served in various managerial positions in manufacturing, engineering and purchasing.

Mr. Hayward was formerly with Pollock Paper Co., Mosinee Paper Mills and Rhinelander Paper Co., having served as West Coast district sales manager for Rhinelander from 1950 to 1956, when he became sales manager for R-W.

Mr. Rouse joined R-W in 1955, coming from the Weyerhaeuser Co. where he was first associated with the accounting department of the lumber division and later with the pulp and paper division.

Other officers in the company are N. F. Becker, president and director, and a director of St. Regis Paper Co.; Howard W. Morgan, vice president and director, and vice president of Weyerhaeuser Co., Pulp, Paperboard and Container Group; Robert W. Boyd, secretary, also controller-secretary for Weyerhaeuser. Other directors in the company are Norton Clapp, president, Weyerhaeuser Co., Benton R. Cancell, executive vice president of St. Regis Paper Co.; Maxwell H. Herriott of the Quarles, Herriott and Clemons law firm of Milwaukee, Wis.; Russell L. Le Roux, Weyerhaeuser Co., manager, manufacturing, Pulp and Paper Div.

Bellinger Promoted At Fraser Paper

Anthony M. Bellinger has been appointed assistant plant engineer of Fraser Paper, Ltd., Madawaska, Me.

Mr. Bellinger will succeed Sterling Shephard who was recently transferred to the Edmundston pulp mill where he will be plant engineer.

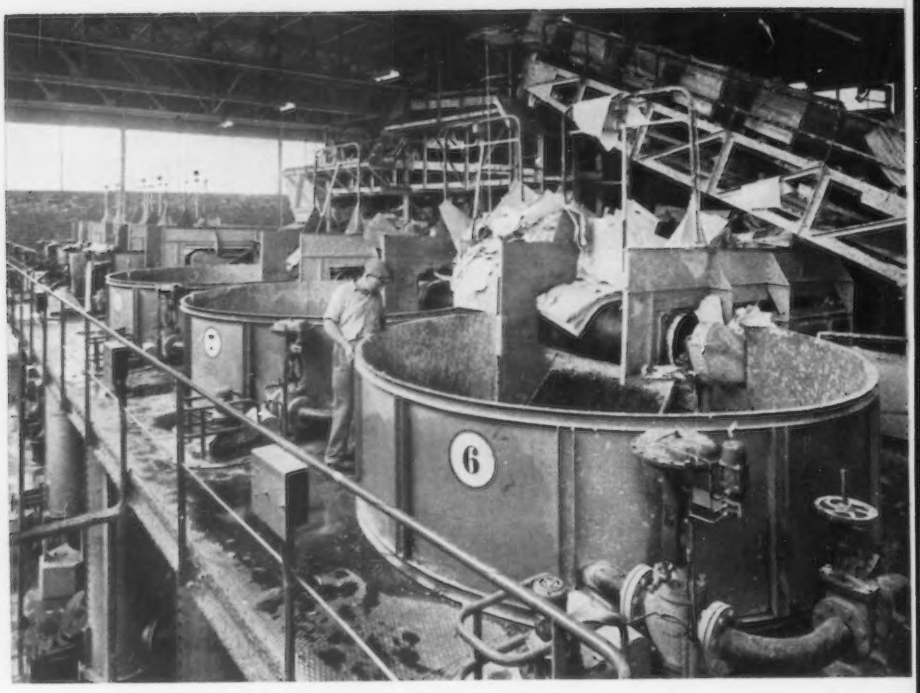
FPBAA Research Director to Retire

William D. Hall, director of research for the Folding Paper Box Ass'n. of America, will retire July 1, FPBAA executive director, G. L. Nordstrom, has announced.

Mr. Hall has been in charge of the association's technical and production activities for the past 10 years, and on behalf of the association, served on various packaging organizations' committees.

While his plans have not been completely formulated, he expects to utilize his broad experience in the graphic arts industries as a consultant in the production and management fields.

Before joining the FPBAA staff in 1951, Mr. Hall held executive positions in the printing industry and was director of production-management department of the Printing Industry of America.



ENTIRE PULPER LINE. Shows individual pulper conveyors discharging into pulpers. Steep incline conveyor in upper right is main system-feed belt which carries bales from yard to overhead platform where baling wires are cut.

How Push-Button Handling of Bales To Pulpers Works at French Mill

Only eight men process seven separate pulps to eight pulpers via a seemingly complicated but relatively simple and automatic conveyor system at La Chapelle.

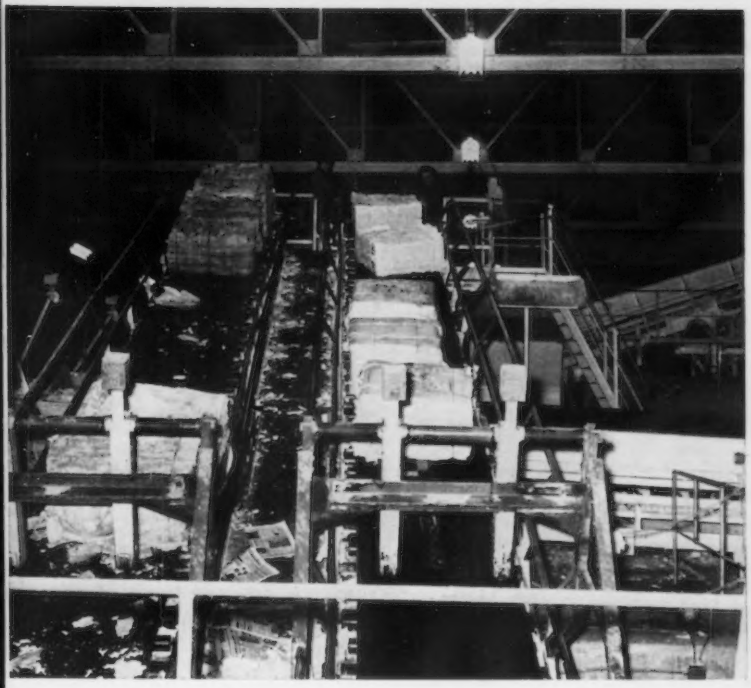
Ernest F. Barker,
European Editor,
Paper Trade Journal

Papeteries de la Chapelle has a fully automated materials handling system for feeding its eight pulpers in the stock preparation department. This ingenious and yet basically simple conveyor system handles all of the baled pulp which goes in the pulpers — all of the pulp needed to supply the mill's five paper machines.

Only eight men per shift are needed to handle all of the mill's baled pulp requirements. These eight men take care of all aspects of the mill's pulp handling, from transportation of the bales into the stock preparation building through pulper charging. Moreover, this same conveyor crew looks after the pulpers, which operate automatically.

One La Chapelle handling crew consists of the following personnel, listed in the order as one would encounter them going through the mill: one lift-truck driver, who feeds the system from the pulp storage yard; one "signal board operator" who directs the lift-truck driver what pulp grades to send into the system and in what quantities; three bale openers who cut the baling wires and remove the wrappers; one "travelling carriage" operator who controls the distribution of the pulp to the pulpers; one wire baler, who also has other general duties in the department; and one general helper. Three such shift crews of eight men each are supervised by one department superintendent.

The La Chapelle mill uses a great variety of pulps: unbleached sulphite, bleached sulphite, bleached kraft and bleached hardwood sulphite. Although the mill operates its own groundwood and cold soda pulp plants (for description of the latter in which match stick size special "PP" chips are used, see PAPER TRADE JOURNAL April 3, 1961), market groundwood pulp is purchased to augment the mill's own production. This latter pulp plus a relatively small amount of waste stock is also handled by the conveyor system de-



PARTIAL VIEW of main system conveyors, which carry bales from yard to overhead platform. Wire-cutter personnel stands at belt at right which is in operation. Belt at left is stationary at the moment. It is pivoted to the right (towards the wire-cutters) when it is to be used.

PULP BALES arrive in yard on "trailer-train," composed of four to five rubber tired carts.

scribed here. La Chapelle, located in northern France, manufactures 600 to 700 tons of newsprint and magazine grades per day. The pulp conveyor system is rated to handle about 4,000 pulp bales per day. This handling capacity provides ample room for expansion in the paper mill because at present only about 3,100 bales per day are required. The pulp bales system are of customary size and weight, each averaging about 440 pounds gross weight. At 4,000 bales capacity this then means that the system can handle 880 air dry tons of baled pulp per day. Many of the bales—groundwood, for instance—have 45 per cent moisture content.

Feed Into System

The pulp bales arrive at the street level entrance of the pulper building on a trailer train. This "train" consists of a small mill-yard truck which hauls four to five rubber-tired carts. The pulp is transported in this manner from the mill's pulp storage warehouse and the mill yard storage area. Pulp can also come directly from ships which tie up at the mill's dock on the nearby Seine River.

When the "train" arrives at the pulper building, a conventional lift-truck equipped with side grabs unloads the bales from the small trailers and transfers them directly onto the system of conveyors which transport the pulp into the building.

One lift truck handles all of the mill's baled pulp, and like the entire conveyor system it is in service around the clock, being operated in three shifts. Only one lift truck operator is required per eight hour shift. He rests one quarter hour every two hours.

An interesting electric signalling board, activated from inside the building, tells the driver the type and quantity of pulp grades to load. On the signalling board are numbers which correspond to the pulper numbers with a large, bright red and green signal light below each number. Below these there is in turn space for chalking in the type of pulps being currently used in the various pulpers. The signalling board simplifies the driver's work immensely. As a result all he needs to do is "fill the orders," i.e. supply needed bales by "reading" the green lights (which obviously mean "pulp needed," while the red lights signal: "No more pulp of this type needed at the moment").

Main Feeding Conveyors

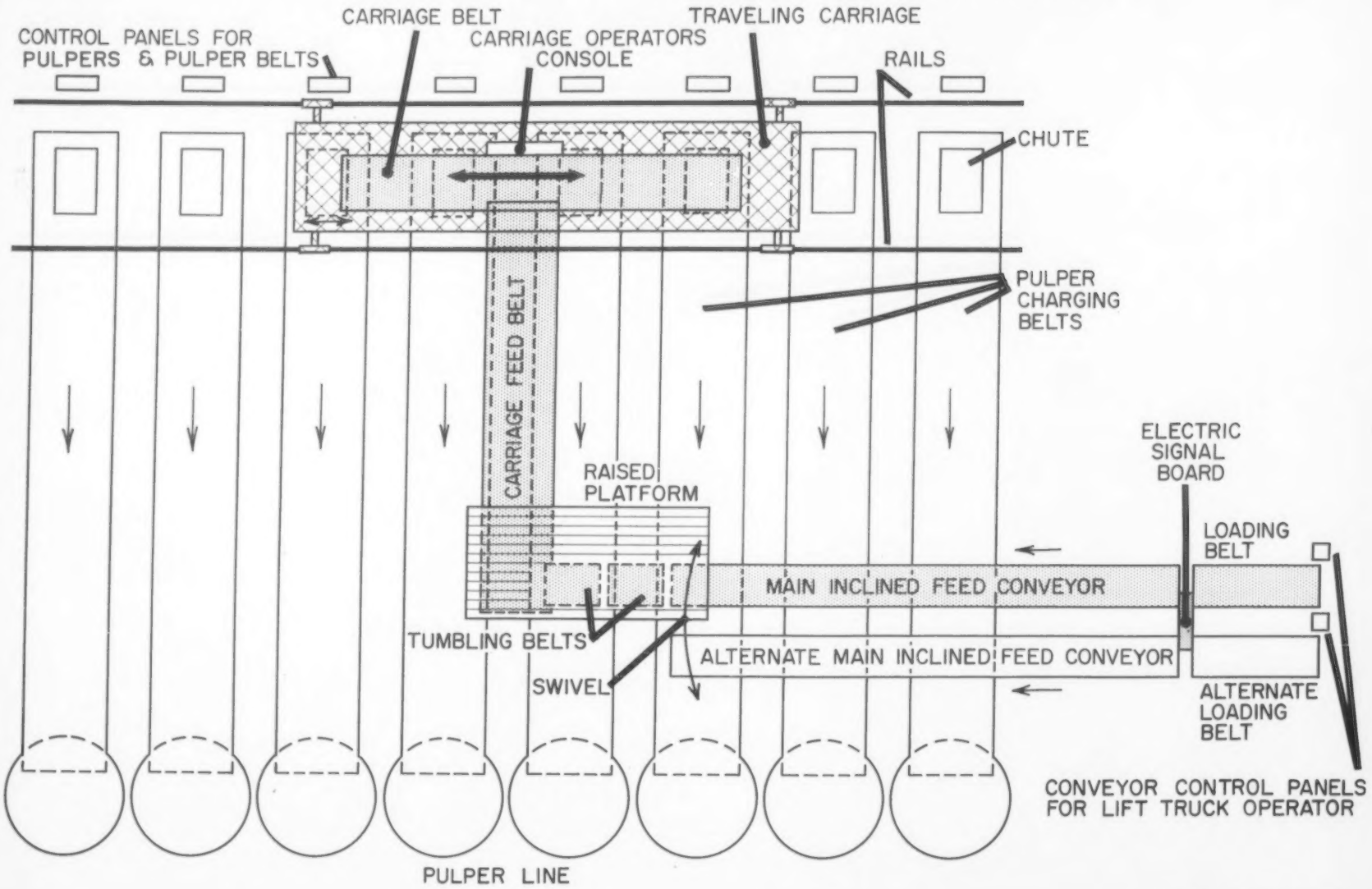
The lift truck driver deposits the bales on either one of two horizontal loading conveyors. Each of these short conveyors is operated by means of a small push button control panel which is so located at the truck unloading point that the driver can reach it without dismounting from his vehicle.

From the loading conveyors the bales are automatically transferred to the two subsequent main conveyors which are three feet, four inches wide, 82.5 feet long and operate at a speed of 19½ f.p.m. These two conveyors have an angle of incline of 30 degrees, resulting in a difference in height of about 28 feet between the yard loading level and the point inside the building where the system's subsequent materials handling facilities are located, above the pulpers.

These two main conveyors are installed in parallel separated by an equally inclined catwalk. These belts are, however, so constructed that they swivel or pivot toward a common upstairs delivery point, which means that only one of these belts actually delivers bales into the system at any one time.

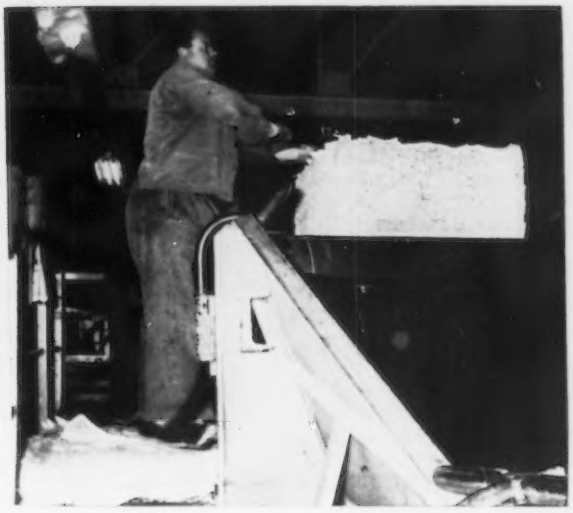
The reason La Chapelle installed two loading and two inclined convey-

Overall Schematic View of La Chapelle's Bale Handling System



Drawn by Staff Artist, W. N. Perry

INITIAL SYSTEM LOADING POINT. Shows the two short belts in foreground and inclined main conveyor in background. Also shows drivers' short belt control panel and overhead electric signal board.



WIRE CUTTER stationed on overhead platform at end of main feed conveyors.

ors at his point is due to the fact that the mill uses many different types of pulp and the availability of two main conveyors consequently greatly eases any loading and availability problems caused by pulp variety. The conveyor actually not in use at any given time can be loaded independent of the "main stream" of moving bales. Both have automatic shutoff mechanisms which are activated when bales reach the top of that conveyor which is at the time not connected with the upstairs "receiving station."

Unwrapping Platform

Inside the building, high above the pulpers, the bales transfer from the steeply inclined main delivery belt to two successive short, horizontal belts having the same width. Here the baling wires and bale wrappers are removed. The first of these two short belts operates at 19½ feet per minute and the second at twice this speed.

The two horizontal belts have a combined length of 12 feet. They are not at the same elevation—the bales drop four feet as they move from the first to the second. This drop makes bale wrapper removal an effortless operation, as follows: As a bale reaches the first short belt, the three-man crew stationed on the elevated platform on which the short belts move, cuts the wires and grabs hold of the thus-loosened wrapper. Then as the bale drops and at the same time turns over or tumbles onto the second short belt, the crew can easily pull off both wires and wrappers.

The wires are dropped down a special chute into the basement where they are subsequently baled. The pulp wrappers are diverted to one of the eight pulpers. The number of this pulper may not always be the same, but only one pulper is used exclusively for this purpose at a time. The reason for this is to remove the bale wrappers from the pulp furnish destined for the production of higher grade papers. The pulp resulting from the wrappers is used only in newsprint furnish.

From the second horizontal tumbling belt on the elevated platform, the now loosened bales move into a transfer conveyor belt. This belt is 5½ feet wide, 29½ feet long and operates at a carriage loading speed of 33 f.p.m. and a reversal (empty) speed of 85 f.p.m. Moreover, this conveyor is installed with a 10° incline. Its function serves not only to transfer the pulp onto the next piece of specialized equipment, but also to help further break down the bale and fan out its individual sheets.

CONVEYOR DIMENSIONS SPEEDS FOR PULP BALE HANDLING SYSTEM

Conveyor	Length (ft.)	Width (ft.)	Loading Speed (f.p.m.)	Reversing Speed (f.p.m.)
Loading Belts	3′	3′4″	13	—
Main Feeding Belts	82′	3′4″	19.5	—
Tumbling Belts	12′	3′4″	39.5	—
Carriage Feed. Belt	29′6″	5′6″	33	85
Travelling Carriage Belt	40′	5′6″	26	105
Travelling Carriage	50′	8′	130	—
Pulper Belts	40′	5′6″	3	111

Center of the System

The heart of this efficient pulp handling system is the specially-designed traveling carriage belt. The carriage, shuttling back and forth on a set of rails much like a traveling crane, carries its own operator as it distributes specific pulp loads onto eight pulper charging conveyors underneath it. The carriage contains its own horizontal conveyor belt which is operable independently of the carriage movement itself. Both the carriage and its belt travel over the tops of a series of chutes which serve to guide the sheets onto the individual pulper charging conveyors.

The inclined transfer belt or carriage feed belt, as it is referred to in

the schematic diagram, rises up to nearly eight feet over carriage level and drops the pulp sheets down onto its belt. This drop facilitates final complete sheet separation from the original pulp bale.

The carriage moves at a top speed of about 130 f.p.m. It is nearly 50 feet long and eight feet wide. The operator stands at a large control console from which he can operate the carriage's movement, the carriage belt, and the belt system which supplies pulp to the carriage. The console is located in the center of the carriage and it and the operator therefore travel with the carriage. This entire assembly moves along rails 91 feet long which is the entire length of the pulper line.

Down Through Chutes

The carriage belt, which receives the pulp from the inclined transfer conveyor, and then distributes it to the appropriate pulper belt feeding chutes, moves at a loaded speed of 26 f.p.m. and an empty speed of 105 f.p.m. This belt is 5½ feet wide and slightly under 40 feet long. Thus, the belt is about 10 feet shorter than its supporting carriage. This difference in length is distributed equally at the ends of carriage and belt so that the resulting five feet of shortage create openings at both ends of the carriage. The pulp drops through these openings into the pulper conveyor chutes below.

The carriage operator, a semi-supervisor, is thus responsible for charging the pulpers. His charts and other written instructions tell him the details of all furnishes and pulper loads. Single-handedly he operates the carriage and all pulper-charging conveyors. He also serves, in effect, as the only pulper operator. The control panels for each of the charging conveyors and its respective pulper is not located on the carriage but is mounted on the wall behind the carriage in a position conveniently accessible to the operator as he charges that particular pulper.

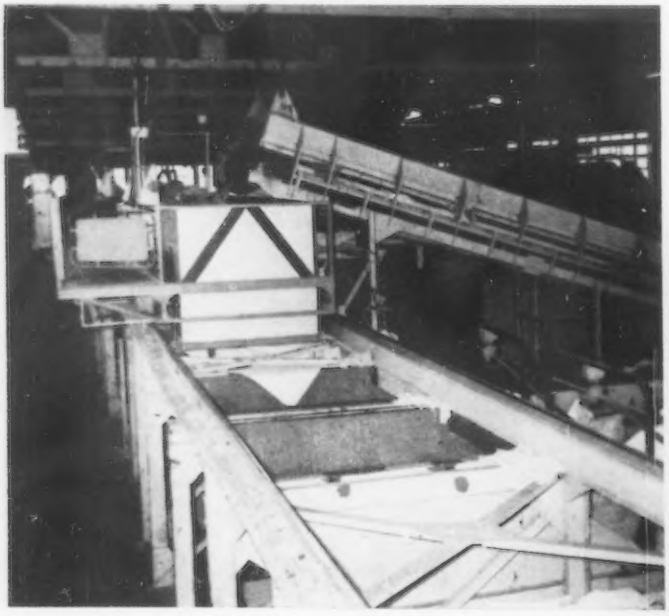
How does the carriage operator distinguish between the grades of pulp on his carriage belt and, therefore, onto what charging belt to divert the pulp? The reader will recall the signaling board which instructs the lift-truck driver as to the grade of pulp desired. This signaling board is controlled by a man stationed on the raised platform, where the bales are unwrapped. This man works in close cooperation with the carriage operator, communicating with each other primarily by a system of hand signals. It is noted that the problem of mixed varieties of pulps appearing on the carriage is not as complex as one may think because the quantities involved here are relatively large and the pulp tends to come in healthy batches rather than being indiscriminately mixed.

Each of the pulper charging belts is 39½ feet long and 5½ feet wide. They all move at loaded speeds of three f.p.m. and unloaded (reverse) speeds of 111 f.p.m.

Lastly, the Pulpers

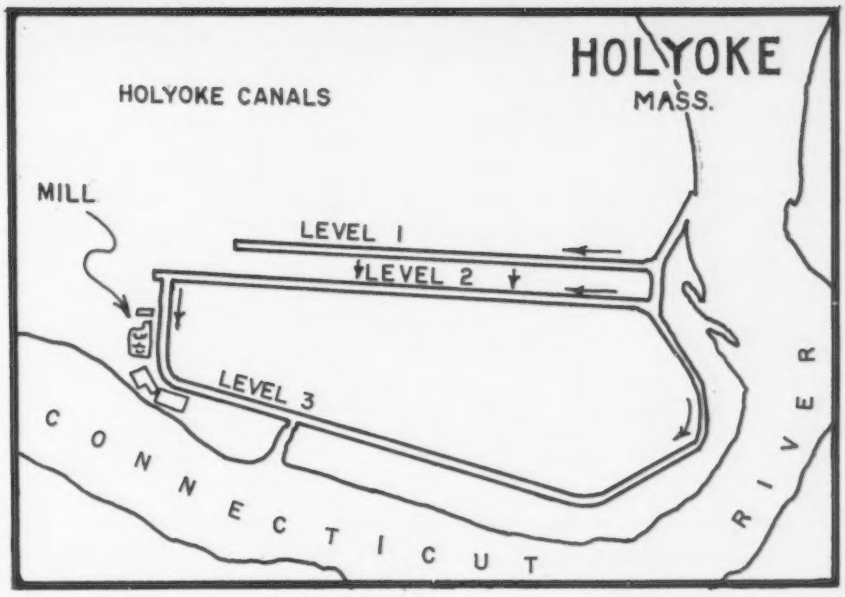
La Chapelle has eight conventional pulpers, four with 100 tons capacity and four with 50 tons capacity. The pulper charging conveyors are usually kept loaded with pulp so that they can start charging into the pulpers whenever the pulper's level drops any appreciable amount. Repulping is continuous; i.e., the pulpers are not operated in batch sequence. Liquid level in the pulpers is maintained automatically, with liquid level controlling consistency regulators which operate feed water valves.

Blending of pulps does not occur in the pulpers nor on their respective charging belts. From the pulpers, the stock goes to refiners and then to storage chests. The pulps are then blended as they are withdrawn from these chests. There is some further stock preparation prior to the machines.



CARRIAGE RAILS in foreground with open chutes to pulper charging belts. Carriage is now servicing belts in rear of building. Inclined conveyor at right center delivers pulp to carriage from overhead platform where bales are unwrapped.

VIEW OF CARRIAGE OPERATOR and console. Controls on wall at left operate the pulper charging belts as well as pulpers.



UNIQUE CANAL SYSTEM. Water is diverted from Connecticut River, at upper right, into canals.

Coagulant Aid for Water Treatment Cuts Costs, Improves Quality

Investigation of a coagulation aid for reducing chemical costs of water purification brought additional benefits in a higher quality water supply to this New England mill.

Earl S. Packard,
Technical Director,
Chemical Fine Paper and Board Div.,
Standard Packaging Corp.,
Holyoke, Mass.

The prospect of obtaining a better quality product at a lower cost has always been an attractive one in any manufacturing operation. It was this prospect that first aroused the interest of the Chemical Fine Paper and Board Division of Standard Packaging Corp. in the overall subject of coagulant aids, and the benefits and advantages which can be obtained through their use.

The potential savings in the use of coagulant aids was first brought to our attention by North American Mogul Products Co. and subsequently the decision was made to conduct a laboratory investigation of their products. The promising results led to a full scale plant evaluation. The end result was the development of a treatment program which produces a better quality water for use in our paper making operations, at an approximate saving of five per cent chemical costs.

When we first started to take a look at the use of coagulant aids, we were not experiencing any specific problems in the operation of our water plant. Color is the most important factor in the control of water quality for our operations, and we were generally able to produce water with a color value of O as measured by a Nessler Colorimeter. Only during the cold mid-winter months were we troubled with appreciable color in the effluent from our water plant, and even then the amount of color was not considered to be high enough to cause any particular difficulties in our mill. Therefore, it was the possibility of an overall cost saving which first interested us.

This article was prepared with the assistance of Stiles B. Twitchell, Jr., Technical Sales Director, The North American Mogul Products Co., Cleveland, Ohio.

Unique Canal System

Raw water for our mill is derived from the Connecticut River. This water is distributed to various plants throughout the city of Holyoke by a

system of canals, which is rather unique. Our water is obtained from the third level (down) canal, which means that a good portion of our raw water has already been used by other mills, before it enters our plant.

The water flows by gravity from the canal into a mixing station, where chemical treatment is added (coagulants, lime for pH adjustment, etc.), and then into a small pond which is used as a settling basin. From the pond, the water flows through rapid sand filters and on into the mill. Daily volume treated is about 8,000,000 gallons. Retention time in the settling pond ranges from 18 to 24 hours, depending upon the amount of sludge buildup at the bottom of the pond, and upon the amount of ice on the surface during cold weather.

This, then, was the system under consideration. With this prospect of a potential cost saving before us, we were interested enough to set up, with Mogul's cooperation, a series of laboratory coagulation tests designed to evaluate various coagulant aid formulations, marketed as Mogul Claracel, and to determine the approximate dosage level which might be required. The results of these tests were quite promising, and material was ordered for a full scale plant evaluation.

Chemical Dosage Stabilized

The use of Claracel in the water purification plant was started on July 11, 1960. At that time, the chemical treatment being used consisted of 35 p.p.m. of alum, and 4 p.p.m. of lime. These dosage levels were continued. The initial dosage of Claracel was 1.5 p.p.m.

After three hours operation, it was quite apparent that the chemical dosage levels were considerably higher than were needed to produce a quality water. The flow being produced was extremely large and was settling to the bottom of the pond within a relatively short distance of the influent from the mixing station. Consequenly, dosages of all materials were reduced, in a progressive fashion, and stabilized after 5 days of operation at the following: alum—21 p.pm., Mogul Claracel — 0.3 p.p.m., lime—0. Effluent water color remained at 0.

Results of operations for the 30-day period before and 30-day period after the introduction of Mogul Claracel are summarized in Table 1.

TABLE I
WATER TREATMENT TRIAL USING CLARACEL
90 DAYS BEFORE VS. 30 DAYS AFTER

	Before	After
Alum usage, lb. per day	2,330	1,890
Lime usage, lb. per day	160	0
Average raw water color*	30	30
Average finished water color	0	0
Average finished water pH	5.94	6.25
Claracel usage, g.p.d.	0	2†

*Color levels of over 30 are recorded as 30. Before, color was over 30 on 5 days; after, color was over 30 on 28 days.

†Final dosage level; higher levels were used during first four days.

Considerable Dollar Savings

For the 30-day comparison, cost savings totaled $175.00, through the use of the coagulant aid, in spite of the fact that a considerable overdosage was used during the first three to four days operation. If this overdosage is written off as experimentation and not included in the cost figures, the dollar saving becomes approximately $225.

An additional saving has shown up also, in the fact that it was possible to eliminate the usage of lime for pH control. This is a direct result of the decreased alum requirement.

For our mill operations, it is desirable that pH of the finished water be maintained between 6.0 and 6.5. In the past, it had been necessary to use lime to maintain a pH in that range. This test, on the other hand, indicated that it might be possible to entirely eliminate the use of lime.

Based on these good results, we

MILL LAYOUT. Raw water is taken from the canal, passes through the chemical mixing station, and flows into the pond through underwater distribution conduit. One story building at upper end of pond is the filter house. Mill proper lies between river bank and canal.

continued the use of Mogul Claracel in the water purification plant. The real test took place during January and February of 1961, which was the most severe winter experienced in New England for a number of years, and when extremely poor raw water conditions were experienced. A comparison of the first two months of 1960 versus the same period in 1961 is shown in Table 2.

Once again, an alum saving of the order of 20 per cent was demonstrated. Although it might have been possible to operate without lime during that period in 1961, we decided to use lime, in order to maintain effluent pH in the middle of the desired range.

Changed Formulation

The most significant point developed during this extremely severe period, however, was that we found it necessary to change coagulant aid formulations, in order to maintain good effluent quality.

During the first few days of low raw water pH, low temperature and high color, we found that the effluent water color was somewhat higher than we felt it should be. Consequently, the North American Mogul Products Co. representative was contacted, and he suggested evaluating another one of their formulations, which he felt would provide better results under the conditions existing at that time. This evaluation was carried out on a laboratory scale; the results indicated that the alternate formulation was better in performance; and its use was started immediately.

The results shown in Table 2 are those obtained through the use of this alternate formulation, which was used during all but four of the days throughout the two month period.

Water Quality Improved

The significant point to be gained from this comparison is the following: effluent water color was over 25 per cent lower than the previous year, although the raw water character and the operating conditions were considerably more severe than the previous year.

During this particular period, the cost of the coagulant aid was somewhat greater than the cost reduction achieved by reduction in alum dosage. However, the improved quality of finished water and the ability to handle extremely poor raw water conditions justify, we believe, the moderate additional cost.

By the end of March raw water conditions had improved, coagulant aid dosage levels had been cut back considerably and in April, we reverted back to the use of the formulation which had originally given such good results. Good results were still being obtained.

To summarize, we feel that there are two specific conclusions which can be reached, based upon three months operating experience with Mogul Claracel coagulant aids.

1. Under extremely severe and unfavorable raw water and operating conditions, we can produce a higher quality (lower color) finished water than heretofore possible.

2. There is an overall reduction in the cost of chemicals required for operation of the water purification plant.

These results have satisfied our original aims.

TABLE II

COMPARISON OF WATER TREATMENT FOR SEVERE MID-WINTER MONTHS

	1960	1961
Alum usage, lb. per day	2,645	2,160
Lime usage, lb. per day	292	307
Average raw water color*	24	25
Average finished water color	5.9	4.3
Average finished water pH	6.02	6.26
Claracel usage, g.p.d.	0	up to 10

*Color levels of over 30 are recorded as 30. In 1960, color was over 30 on 2 days, in 1961, color was over 30 on 9 days.

Collector's Item: First American Edition of 17th Century Book

Papyrus or The Craft of Paper—For the collector or one who has a deep and abiding interest in the history of paper, this is a uniquely interesting book, both for its text, a poem on papermaking, and the handmade paper on which it is printed.

"Papyrus" was written in 1693 by Father Jean Imberdis, S. J., to celebrate the art of papermaking in his native town of Ambert, in central France. The poem is a unique document as it accurately describes in about 500 Latin hexameter lines the entire paper making process of that period from choice of a mill site to the final steps of finishing paper. Considering the nature of the subject, the poem is quite an accomplishment.

Of the original 1693 edition, the only known copy belonged to an 18th century collector. The first English translation was made by Professor Eric Laughton of Sheffield University in 1952. It is this translation which appears in this first American edition of "Papyrus."

Appropriately, the paper on which the text is printed was entirely hand made by Henry Morris in his own small mill in North Hills, Pa., simulating the process from out of the past. The text is hand set in Centaur and Arrighi types.

This most unusual book, containing 36 pages, price $6.00, is available from the Bird & Bull, Private Press of Henry Morris, 321 Elm Avenue, North Hills, Pa.

1961 Edition of CPPA Reference Tables Published

Canadian pulp and paper exports in 1960 totaled some $1,124,000,000, equivalent to 21.3 per cent of Canada's total domestic exports, according to the 1961 edition of Reference Tables, just published by the Canadian Pulp and Paper Ass'n.

The book contains 95 statistical tables, covering every aspect of the pulp and paper industry's operations. The figures are drawn from the Dominion Bureau of Statistics, the Newsprint Ass'n. of Canada, the Canadian Pulp and Paper Ass'n. itself, and from many other sources.

It covers the impact of the industry on the Canadian economy, and shows it ranks first among all Canadian manufacturing industries in gross value of production, salaries and wages, exports, and employment.

Copies of the Tables are available from the Canadian Pulp and Paper Ass'n., Sun Life Building, Montreal.

New Ion Exchange Process For Base Recovery

D. F. Manchester,
Central Research Division,
Abitibi Power & Paper Co.

and

J. P. Termini,
Ionac Chemical Co.,
Division of Pfaudler Permutit, Inc.

A simple process for recovery of soluble bases from blowpit liquor, the Abiperm ion exchange method avoids evaporation and burning of spent liquor. Base is directly transferred to Permutit Q (a cation exchange resin of the sulphonic type) and then released as a re-usable bisulphite solution by contacting the resin with sulphur dioxide solution.

Operation of a pilot plant, scaled to handle liquor from approximately one ton of pulp daily, demonstrated the conversion of over 80 per cent of the sodium contained in sodium-base sulphite spent liquor to product at a concentration of one per cent combined sulphur dioxide. Total base recovery of 65 per cent is expected on the assumption of 80 per cent recovery from the blowpits.

Detailed investigation of the disposal of the decationized spent liquor is under way. Concentration of this liquor allows access to special products or to combustion for heat recovery, SO_2 recovery and pollution abatement.

Within Abitibi, a company with relatively small sulphite mills, all types of soluble base sulphite cooking were investigated as alternatives to the normal calcium. A preference was soon established for sodium as the long term competitor because of its versatility throughout the sulphite range, from acid sulphite to neutral sulphite semi-chemical. A main factor was the knowledge that the Arbiso process, with its inherent simplicity, provided sulphite pulp of unusual and exploitable properties at all yields, from the extreme of 90 per cent down to bleachable, high strength slush pulps, in the 46-55 per cent yield range. Only the cost of cooking chemical appeared to be unfavourable.

Recovery and Base Problems

Although numerous methods have been proposed for recovery of chemical values from sulphite effluents no single process has yet won widespread acceptance. Regardless of base, the common approach has followed the line of kraft recovery with its requirement of highly efficient pulp washing, evaporation, combustion and reconstitution of cooking acid. When the inexpensive calcium is used, pulping is restricted to the acid sulphite cook and while scaling, corrosion, combustion and ash disposal problems can be overcome, only heat is returned and this in quantity insufficient to justify the expense except in areas of high fuel cost. Ammonia is much less confined with respect to pulping and difficulties relating to the burning of spent liquor are at a minimum; unfortunately the ammonia is destroyed in the furnace. Magnesium is in a better position, being applicable to acid sulphite and bisulphite pulping and having the impetus of successful recovery in several mill installations. In the latter case economic considerations appear to dictate high pulping capacity, a serious limitation for many mills.

Being unhampered by solubility of pH, sodium has been applied successfully to the production of all types of sulphite pulp. Application of the kraft recovery concept, on the other hand, faces imposing problems: evaporation of the corrosive spent liquor, combustion in the presence of a relatively volatile ash, and finally conversion of the smelt to usable cooking acid, a step involving separation of the sulphide and carbonate fractions, transformation of sulphide to sulphur dioxide and preparation of sodium sulphite and bisulphite solution. Various well-known processes have been developed which differ primarily in the methods by which the stages of conversion are accomplished. Thiosulphate formation has been a persistent problem since high concentrations render a cooking acid unfit for the acid sulphite process.

Such sodium recovery processes were not attractive because of high capital costs and questionable economic performance. The decision was made to attack the cost factor by establishing a long term project which had the limited objective of recovering chemical values economically from spent sulphite-type liquors. It was stipulated that conventional evaporator-furnace techniques were to be avoided which eliminated the ion exchange methods of handling the smelt solution.

New Approach

Effort was thereafter concentrated on the feasibility of direct ion exchange. The main question became one of selecting a cation exchange resin which would serve efficiently in the dual but conflicting roles of extracting sodium from spent liquor lignosulphonates and then releasing the sodium to sulphurous acid but it was also mandatory that the effluent from the ion exchange regeneration phase should provide the base at the concentration suitable for mill use without evaporation.

Permutit's earlier studies on spent sulphite liquor and experience in all aspects of ion exchange technology provided valuable background information. Subsequent laboratory and pilot plant research gave unexpectedly good results when preferred resins were combined with operating techniques tailored to the specific demands of the project.

Favorable results from bench type and larger scale experiment led to the decision by Abitibi and Permutit to build at Sault Ste. Marie a pilot plant having the capacity to process the spent liquor from approximately one ton of sulphite pulp daily. To date 280 cycles have been completed.

Release of sodium from the resin is accomplished with sulphurous acid. Fortunately the Sault mill was using liquid sulphur dioxide rather than sulphur for acid-making and it was decided that the preparation of regenerants would be greatly simplified by its use. Passage of the acid regenerant through the ion exchange material serves both to restore the resin to its hydrogen form in preparation for the next loading phase and to release the sodium as the bisulphite.

Resin Selection and Stability

The heart of the process is the exchanger. For the process to be practical it was necessary to select a suitable cation exchange material, one with the ability to absorb and release base efficiently and of the highest capacity, with the assurance that neither poisoning nor chemical

attack would drastically alter its characteristics; a material in commercial production was preferred.

Proposed Mill Process

A flow sheet of the proposed mill process is given in Figure 1 which is divided into three parts: existing plant, the base recovery section and a waste treatment section. A primary objective of the project was to develop a sodium recovery method which would be economical in small sulphite mills. Heavy and expensive equipment such as evaporators was, therefore, to be avoided as were radical changes in the normal operation of the sulphite mill. This aim has been accomplished, we believe, with the use of blowpit liquor on the ion exchange columns and the delivery of raw acid, of standard analysis, to the raw acid tanks. With appropriate, but relatively minor changes, in existing plant the base recovery section can be attached to serve as the acid-making function. Efficient blowpit washing, probably by the displacement method, is necessary but vacuum drum washers are not contemplated. The ion exchange portion also includes the equipment required for removal and recovery of excess sulphur dioxide from the exchange column product.

A separate but complementary phase of the project received attention once the base recovery theme was reduced to a factual basis. This concerns the decationized spent liquor effluent emerging from the ion exchange column, largely in the form of free lignosulphonic acid, almost free of ash and its related problems but containing all the organic matter salvaged from the blowpit. As a lignin product it has interesting properties. As a fuel it has higher calorific value per unit than other liquors with the possible exception of ammonium-base liquor and avoids, we think, several of the problems encountered in other recovery systems. In either case concentration of the liquor is required for its further use, possibly by evaporation, possibly by freeze-concentration. These aspects have been under study for some time in the hope that concentration and combustion can be justified on the basis of economic consideration alone, quite aside from stream pollution benefits.

Economic Estimates

The following economic estimates are based on a thorough engineering study done by an engineering — research — operations team for a mill division of Abitibi Power & Paper Co., Ltd. It was assumed that the mill had already converted to sodium-base pulping, that sulphite capacity was 80 tons per day air-dry No. 1 unbleached pulp, that a soda ash slurry system was already installed, that base recovery but not effluent disposal was the point of interest, and that the new plant would be automated as much as possible. Problems of integrating the proposed ion exchange recovery process with existing facilities, man-power requirements, additional operating costs and the like were all considered for this capacity and the data were then projected for capacities of 160 and 225 tons daily.

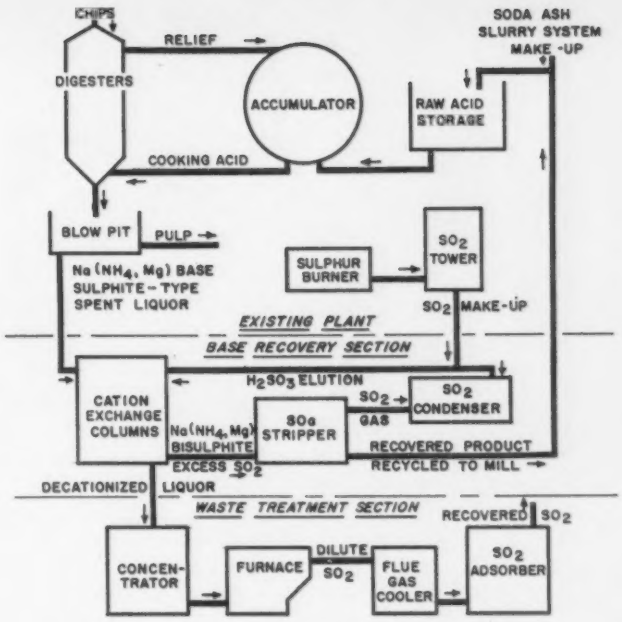


FIGURE 1. ABITIBI-PERMUTIT RECOVERY PROCESS

The figures presented substantiate the conclusion that base recovery by this new process will be profitable, at least within the scope of the present terms of reference. Payout times in the range 6.8 to 2.6 years and savings of $1.17 to $3.90 per ton of pulp appear as the extremes which is based on 310 operating days per annum. For mills operating 330 days or more savings would be substantially higher.

Estimates of the economic feasibility of concentrating and burning the decationized spent sulphite effluent from the ion exchange system for recovery of heat and sulphur dioxide are not yet complete. Prospects of profitability in this phase, along with the simultaneous removal of approximately 80% of the spent liquor load in mill sewage for reduction of stream pollution, provide a substantial stimulus for further work along these lines.

Summary

Advances in ion exchange technology have made it practical to transfer soluble bases directly from spent sulphite liquor to an ion exchange resin and to reconstitute cooking acid by regenerating the exchanger with sulphurous acid and fortifying with make-up base.

Extended operation of a pilot plant, has proved repeatedly the recovery of over 80 per cent of the base in sodium-base acid and bisulphite spent liquor. All recovered base is obtained at a concentration of about one per cent combined sulphur dioxide. No deterioration or poisoning of the resin was observed. Calcium, at concentrations greater than expected for the integrated mill plant, was found to be no problem.

The compatibility of the Abiperm process within existing mills is dependent on the efficiency of spent liquor recovery from pulp and on cooking acid specification, matters of individual mill practice.

The base recovery process also provides a low-ash spent liquor effluent having interesting possibilities for profitable fuel and by-product uses and for a simplified approach to pollution abatement in the industry.

Summarized from a paper presented at the 1961 Summer Meeting of the Technical Section, Canadian Pulp and Paper Ass'n.

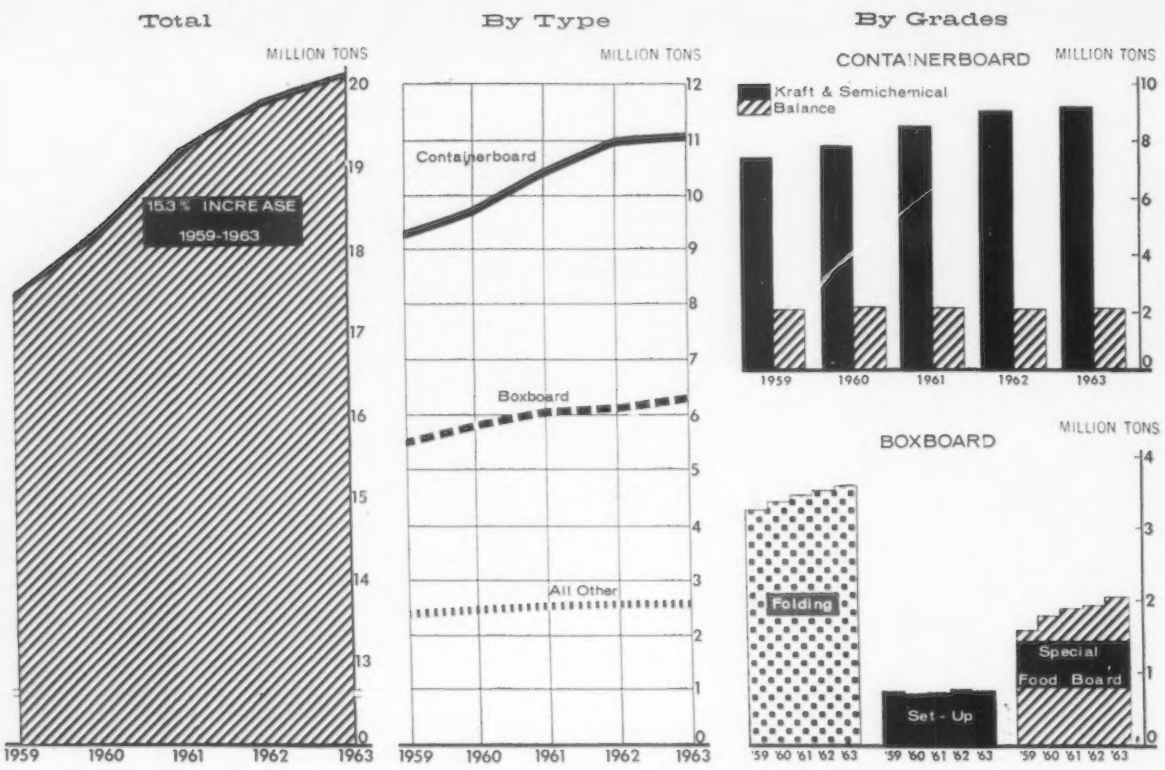


FIGURE 1—Survey paperboard capacity—1959-1963 (313-day basis)

Recent Trends in Paperboard Production, Capacity and Prices

Reviewing dominant factors in this important segment of our industry, with a report on the current pick-up in demand.

Alvin A. Newburg,
Statistician, National Paperboard Ass'n.

Referring to Figure 1 and Table I from the Statistical Yearbook, you will find data showing paperboard capacity covering the five years, 1959 through 1963. These figures were obtained by sending a questionnaire to each known manufacturer of paperboard asking for data on their paperboard capacity. This is done in conjunction with the American Paper and Pulp Association. We find that this restrains a company from listing their capacity in both paperboard and in paper. You will find that the results of this survey are an improvement over the previous surveys. I would like to point out that these figures are on a 313 days a year basis, which is six days a week plus the one day that our calendar contains. Now we have some people who say that we should show our figures on a seven-day basis or on an "All Out" basis as that is more realistic. I'm not too sure about that. We state at the bottom of the sheet that if all conditions are favorable, it would be possible to operate approximately 340 days per week. Three hundred and forty days means 108.6 per cent of the six-day week. But the industry has never operated over 99 per cent of a six-day week in any one year, and that only once, and during the last five years we used our machines an average of 90 per cent of a six-day week, 83 per cent of an "All Out" week and 77 per cent of a seven-day week.

From a paper presented before the National Paperboard Ass'n., Spring Meeting, Fairmont Hotel, San Francisco, Calif., May, 1961.

Editor's Note: All the figures referred to in this article are from the Statistical Yearbook of the National Paperboard Assn.

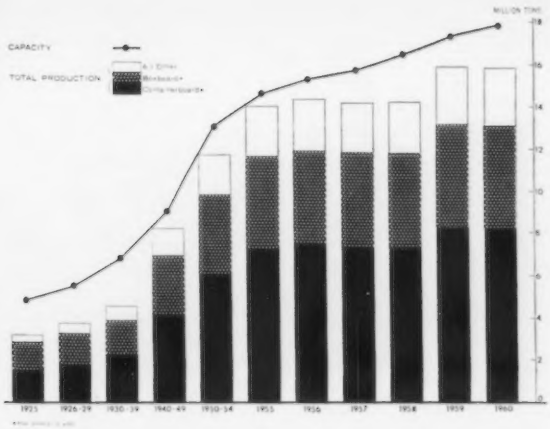


FIGURE 2—Total paperboard production and capacity — 1925-1960

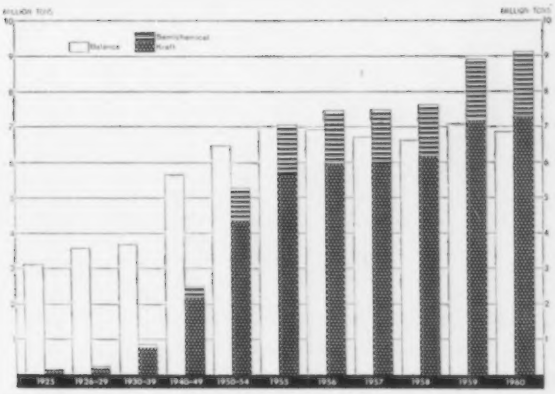


FIGURE 3—Kraft, semichemical and balance of paperboard production—1925-1960

Paperboard Production and Capacity 1925-1960

Figure 2 shows production and capacity figures covering the years 1925 through 1960. The capacity figures are obtained by dividing the total production by the per cent of time the machines were used and multiplied by 100. We believe that these figures reflect the actual operating capacity which was used as contrasted with the total available as given on the survey figures.

Let's take a look at the production. Nineteen-hundred-and-sixty had total production of 15,930,000 tons. It appears to us that there is very little wrong with 15,930,000 tons of production except the outside or fringe items. For example, we increased our capacity and we didn't actually need it. We also did a poor job on the forecasts—we had anticipated roughly a million more tons than we actually produced. But we were extremely happy with the same tonnage the year before. Again, and maybe this is the worst point, we didn't always merchandise on the correct basis.

Actually, 1960's tons are only 2 per cent less than that made in 1959. We have been accustomed to annual

SURVEY PAPERBOARD CAPACITY 1959 - 1963
313-DAY BASIS
M Tons

ITEM	TOTAL PAPERBOARD	CONTAINERBOARD							BOXBOARD			ALL OTHER
		LINERS		CORRUGATING MATERIALS								
		Cylinder Kraft	Fourd. Kraft	Jute	Kraft	Semi-chemical	Straw	Other	Container Chip & Filler Bd.	Folding	Set-Up	Special Food Board	
1959													
Capacity End of 1959	17,447	191	4,998	983	96	2,061	117	663	292	3,258	728	1,600	2,460
Daily Capacity End of 1959	55.74	.61	15.97	3.14	.31	6.58	.37	2.12	.93	10.41	2.33	5.11	7.86
1960													
New Machines	545	—	246	—	—	61	—	34	—	11	—	193	—
Improvements	190	—2	—37	5	8	91	—	9	3	91	—10	2	30
Capacity End of 1960	18,182	189	5,207	988	104	2,213	117	706	295	3,360	718	1,795	2,490
Daily Capacity End of 1960	58.09	.60	16.64	3.16	.33	7.07	.37	2.26	.94	10.74	2.29	5.73	7.96
1961													
New Machines	741	—	344	—	78	204	—	—	—	34	—	36	45
Improvements	261	—3	51	—9	—29	89	—47	17	1	85	5	64	37
Capacity End of 1961	19,184	186	5,602	979	153	2,506	70	723	296	3,479	723	1,895	2,572
Daily Capacity End of 1961	61.29	.59	17.90	3.13	.49	8.01	.22	2.31	.94	11.12	2.31	6.05	8.22
1962													
New Machines	514	—	372	—	—	79	—	—	—	—	16	19	28
Improvements	115	—	50	2	—1	8	—13	2	—1	37	3	8	20
Capacity End of 1962	19,813	186	6,024	981	152	2,593	57	725	295	3,516	742	1,922	2,620
Daily Capacity End of 1962	63.30	.59	19.25	3.13	.49	8.29	.18	2.32	.94	11.23	2.37	6.14	8.37
1963													
New Machines	188	—	31	—	—	—	—	—	—	47	—	110	—
Improvements	107	3	57	2	—	19	—	5	—2	25	—1	—	—1
Capacity End of 1963	20,108	189	6,112	983	152	2,612	57	730	293	3,588	741	2,032	2,619
Daily Capacity End of 1963	64.24	.60	19.53	3.14	.49	8.34	.18	2.33	.94	11.46	2.37	6.49	8.37

Information obtained from responses to survey of Capacity by grades. Above data on 313-day basis; if all conditions are favorable, it is possible to operate approximately 340 days per year, which is called Maximum or All-Out basis.

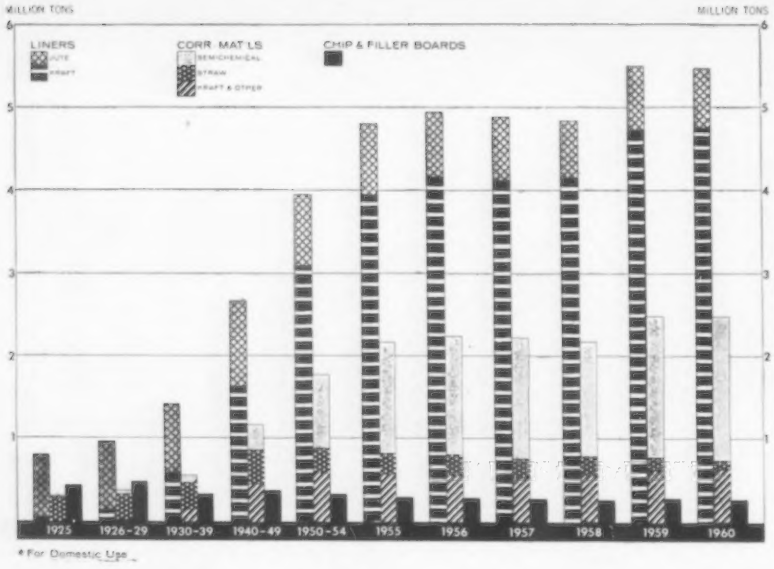


FIGURE 4—Containerboard production by grades—1925-1960

increases and when we have a year that doesn't increase, we think we're hurt. The growth covering a two-year period is quite good and above normal.

Part of the title of this report is the current pickup in paperboard. Let's discuss the total production for four months of 1961 and see what it looks like. For approximately a year, we have been reporting volume at a slightly lower level than the identical period of the year previous. This also held true for the first two months of 1961. As of the end of February, the paperboard industry was 4.1 per cent behind the first two months of 1960. At this point, our picture which had been fairly black begins to see a few streaks of light. During the month of March, the industry produced an average of 319,300 tons per week as compared with 318,300 in March of 1960. April has the effect of a holiday in it which lowers the month's average week to 315,800 tons per week as compared with 311,000 tons in 1960. At this point, we've taken our cumulative loss which was 4.1 per cent and turned it around to a 1.4 per cent decrease. We expect that we will have a demand facing us for each of the following months higher than the equivalent months of last year.

Analysis of Paperboard Production by Types

Figure 3 shows a series of production figures for kraft, semi-chemical and for the balance of paperboard as items in themselves. This study, over the years, is quite significant. The 1960 production shows that kraft had an increase of 2 per cent over 1959, semichemical had an increase of 2.3 per cent and the balance of paperboard had a decrease of 3 per cent. These add to the industry decline of 0.2 per cent. Each week we show two sets of figures on the overall reports, namely combination board and solid wood pulp board. For the first four months of 1961, we find the combination board is 7.3 per cent behind the same period in 1960 while solid wood pulp board is 3.2 per cent ahead. In the folding grade, combination board is down 2.3 per cent and solid is up 2.7 per cent. In all other board as an item in itself, combination board is behind by 2.8 per cent and solid ahead by 13.7 per cent.

Containerboard Production

Figure 4 shows the containerboard production in detail. Again we find production in 1960 was not too bad compared to 1959. Actually, we were only one-half of one per cent behind and in some grades there are small increases. For example, fourdrinier kraft grade increased 1.1 per cent between 1959 and 1960. The semi-chemical corrugating medium increased 1.3 per cent and all other corrugating medium increased 6 per cent. But we have decreases in the other grades listed.

In checking the statistics for 1961, we find current demand very good. The first 10 weeks of 1961 were at a low level compared to 1960. On March 11 of this year, containerboard was 5.6 per cent behind the same period in 1960 but as of the end of April, the loss was cut to 2.9 per cent. This pickup is again in fourdrinier kraft liner and semi-chemical corrugating material while the balance of the commodities are showing fairly large decreases.

Boxboard Production

Figure 5 shows boxboard production. Here again we find that productionwise, 1960 did not warrant the complaining that went on during the year. For example, the difference between 1959 and 1960 is only 9,300

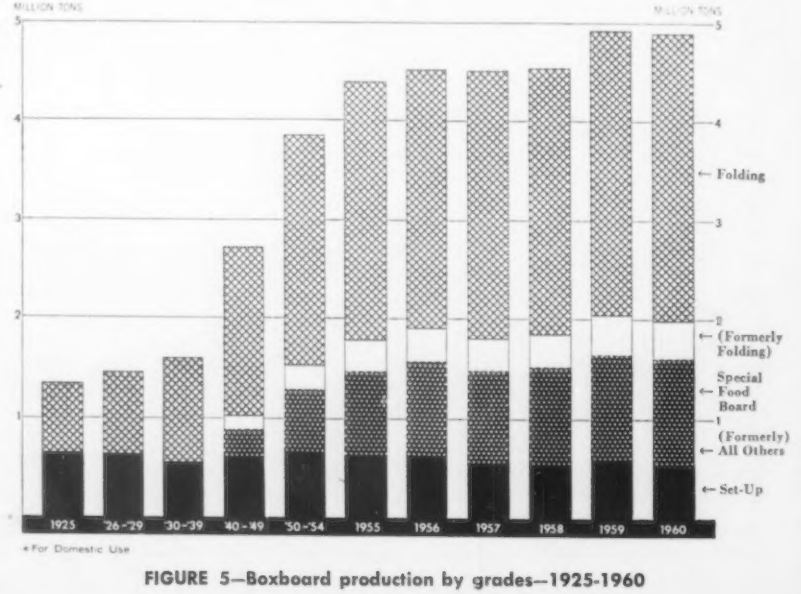


FIGURE 5—Boxboard production by grades—1925-1960

tons or a 0.2 per cent loss. While our total boxboard production is quite good, set-up board had a fairly poor record during the year because as you see, that commodity again lost position and the tonnage is at the lowest point since back in 1946, fourteen years ago.

Special Food Board Production

We show some production information in Figure 6 for special food boards. The production in 1960 is the largest in the history of this division. This group has had a fine growth. In fact, it is so good that it has invited many companies to enter the field with new capacity. Most of the tonnage is made in the south where they are geared to operate seven days a week. If we estimate that special food board would have a five percent growth this year, they would produce roughly 1,525,000 tons. They will have capacity at the end of 1961 on an "All Out" basis, which is not up to seven days, of 2.1 million tons. This gives an operating time of 72 per cent. As you can see, the growth factor has been properly discounted for a number of years to come.

Seasonal Trend-Activity

We find activity and seasonal trends in Figure 7 which harkens back to the subjects of capacity, six and seven day running time and overcapacity. I find it very hard to define overcapacity. It's an over-simplification to merely say that it is an excess at any given moment. The seasonal trend in Figure 7 of production shown, assumes that the average month is an index of 100 but July is 86 and December is 91. Does this mean that we have overcapacity when our seasonal demand is at only 86 or 91? October, with a demand of 108, is only two months after July's index of 86—a difference of 25 per cent in two months. The statistical conclusion is that a seasonal drop in volume cannot be avoided in our remarkably inelastic industry. In the 10 year period 1930 through 1939, the average machine operated 67 per cent of a six day week. That's four days operation a week and my guess is that in many of those years we made more profit on our investment than we're doing now when we are running over 90 per cent.

Containerboard-Boxboard Prices

I would like to talk about the containerboard and boxboard prices that we show in Figures 8 and 9. It's not too pretty a picture because we

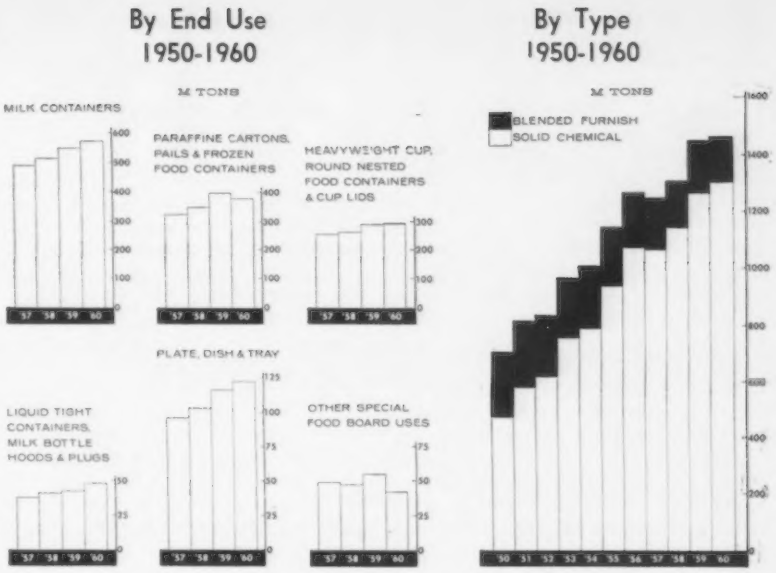
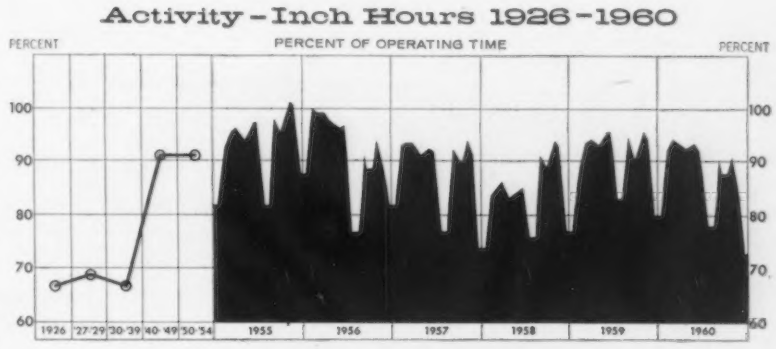

By End Use
1950-1960
M TONS
MILK CONTAINERS
PARAFFINE CARTONS, PAILS & FROZEN FOOD CONTAINERS
HEAVYWEIGHT CUP, ROUND NESTED FOOD CONTAINERS & CUP LIDS
PLATE, DISH & TRAY
LIQUID TIGHT CONTAINERS, MILK BOTTLE HOODS & PLUGS
OTHER SPECIAL FOOD BOARD USES
'57 '58 '59 '60
By Type
1950-1960
M TONS
BLENDED FURNISH
SOLID CHEMICAL
'50 '51 '52 '53 '54 '55 '56 '57 '58 '59 '60

FIGURE 6—Special food board production



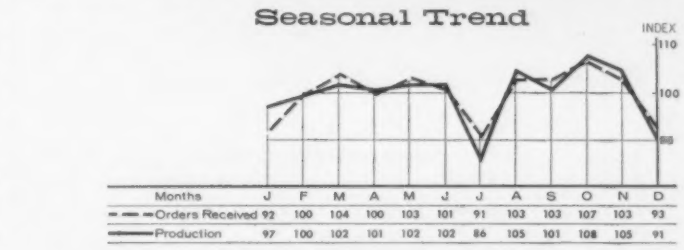


FIGURE 7—Activity—inch hours and days to run

have a number of grades which have been reduced in price in the last part of 1960 and we understand that in a couple of cases we have had more cuts in 1961. The other day we had occasion to look at the BLS All Commodity Price Index, using 1926 as a base of 100 and compare it with our figures. We found that the Index for All Commodities for the year 1959, was 183.8. It fluctuated around this figure in 1960, averaging 183.9 for the year. As of March, 1961, it increased to 184.3. In other words, the customers of our customers are selling their products at a level that reflects some of their increased costs. However, ours are going the other way. For example, the semichemical corrugating material price shown in figure 8 is down ten per cent in November and December and is now down another ten per cent. The other corrugating material as shown follows it immediately. In boxboard grades we have declines in every single grade in Figure 9. We know that some of our direct customers are not making too much money. Folding box in 1960 has a net profit on sales of 1.4 per cent. Corrugated box manufacturers, according to some typical plants, had only 0.7 per cent net profit on sales. The Fortune Survey of the largest 500 companies in the country shows that ten companies who made the high profits in 1959 ranged from 15.4 per cent to 23.5 per cent. The 500 companies in their survey averaged 6.1 per cent profits on sales after taxes.

Mr. Holzheimer's report* said, "the problem of your industry is very clear—it's almost exclusively in the area of pricing."

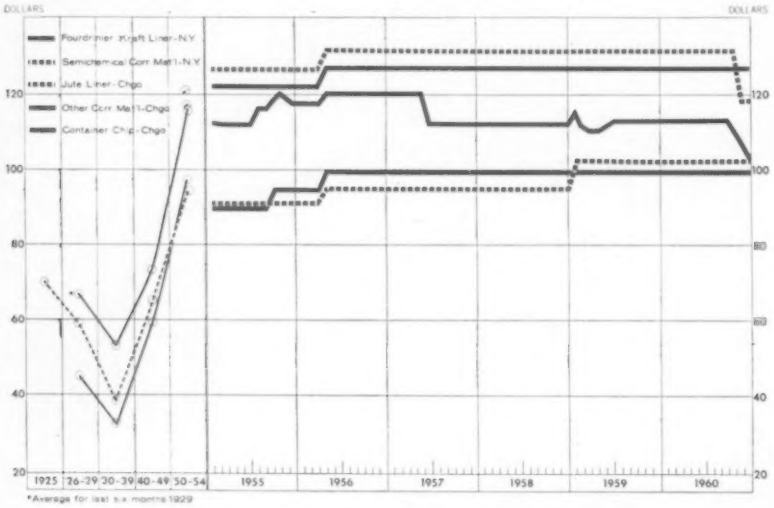


FIGURE 8—Typical containerboard prices—1925-1960

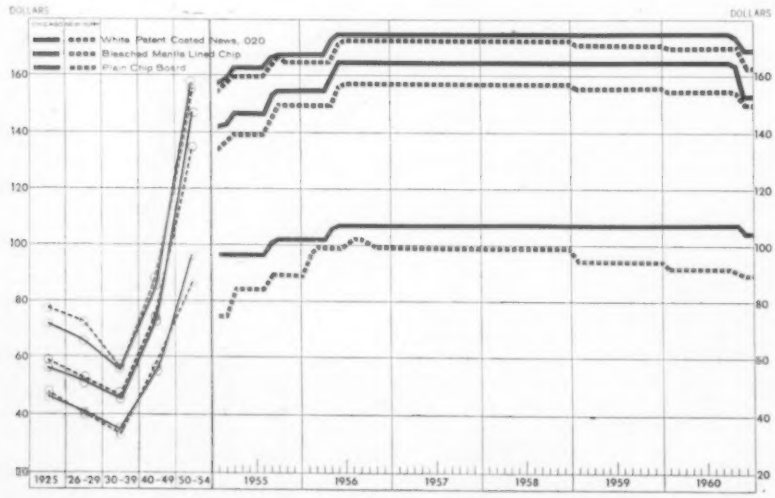


FIGURE 9—Typical boxboard prices—1925-1960

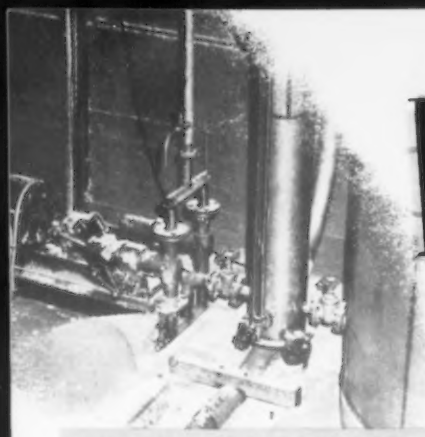
Recently at the Fibre Box Ass'n Spring Meeting, Carl Holzheimer talked about the paper industry.* He is in the investment counseling business. He keeps "books" on ten of the 20 largest companies in our industry and told us about their profits. Eight of these ten companies showed zero earning growth between 1950 and 1960 yet the paperboard tonnage volume went up 43 per cent. Each of the ten earned less money in 1960 than they did in 1955. Total per share earnings were $24.88 for 1955 and $20.17 for 1960, a drop of 19 per cent. Yet we estimate that the paperboard sales dollars increased 20 per cent.

Mr. Holzheimer is a very astute gentleman. He said that, "the problem of your industry is very clear—it's almost exclusively in the area of pricing," What he is saying is that the industry has not wisely solved its merchandising problems in the last five years. It will be interesting to watch whether it will do better in the anticipated demand increase which is generally predicted for the immediate future by all forecasters. We can't have a cartel—we can't have a price agreement, so let's look the facts in the face and do a constructive job for ourselves because we've got good business and it's going to increase.

Before I conclude, may I review some facts on inflation. In the last 20 years the index of consumer prices, which is the most accurate yardstick of the cost of living that statisticians have been able to devise, has more than doubled. In fact, based on the index we spoke about a minute ago, it has gone from 87.3 to 184.3. In converse terms, a dollar bought less than half as much.

Just stop for a minute and look at this current history. If we have a machine that we charged off in ten years when we went to replace it, it cost us one-half more than it did when we bought it. If we charged it off in 20 years, we have to pay twice as much as the original cost. How do we "make out" if we haven't made provision for these items in our selling prices. Inflation isn't through. The Kennedy administration is committed to it and the Federal Reserve Board is going to help them out.

* See Paper Trade Journal, June 5, 1961 for Mr. Holzheimer's speech.



BECCO ECHO

PUBLISHED BY BECCO CHEMICAL DIVISION Food Machinery and Chemical Corporation, New York 17, N.Y.

Paper prefers Peroxide . . .

PAPER MAKERS are constantly seeking new and better ways to make paper whiter, brighter and stronger. And Becco Hydrogen Peroxide is helping spur progress in papermaking. Here's how we worked with three major pulp manufacturers to increase mill efficiency, improve paper quality, *and* cut costs—through new systems using Becco Hydrogen Peroxide:

A modern cold soda pulping facility is operated by Packaging Corporation of America. In its Filer City, Michigan plant, bleaching of the caustic-impregnated pulp is done in disk refiners using Becco Hydrogen Peroxide. This process provides an economical method of treating hardwoods which would otherwise be too dark for use.

Or consider Continental Can Company's latest project . . . a 350-ton capacity pulp and paperboard mill in Augusta, Georgia. It incorporates Becco's Refiner Bleaching Process in which the cold soda pulp is bleached by metering Becco Hydrogen Peroxide to the chips as they enter the refiners. The pulp brightness is increased about 20 GE points.

At the Keyes Fibre Company, Shawmut mill, Becco engineers spent several years developing the advantages and cost savings possible through installation of a new simple single-stage high density Hydrogen Peroxide bleaching system. Adaptability of high consistency bleaching to Keyes' "crumb" method of handling pulp was one of the deciding factors in its selection. Result: Savings on equipment and greater output per unit of space.

Can your pulp use a little assistance from Hydrogen Peroxide? Becco will be glad to provide you with technical data through a survey and estimate of your needs. Write to us at Dept. PTJ-61-9.

BECCO ECHO

No Fish Story Here!

MEN are natural exaggerators when they describe the results of their fishing trips. Let them catch a minnow, and they bring home a whale! Becco, on the other hand, bends over backwards to assure *accuracy* in the delivery of specified quantities of hydrogen peroxide to its customers.

Thoroughly cleaned and carefully inspected aluminum drums are placed singly on Howe or Toledo scales; the reading is set at zero. The drums are filled with filtered hydrogen peroxide until the scale shows the labelled shipping weight. Carboys are handled similarly. These scales are inspected monthly by representatives of the scale company to maintain accuracy.

At our Buffalo plant, a Howe Track Scale and Type Registering Weighbeam is used for weighing tank cars and tank trucks. In the case of a tank car, the vehicle is placed on the scale, weighed, and a record is made of the tare weight. Filtered hydrogen peroxide is pumped into the car until it is filled to the base of the dome. It is then inspected, since the load, if not filled to the exact height, can cause the car to oscillate dangerously when it is in motion. The car is sealed and weighed. The difference between the two readings is the weight of hydrogen peroxide in the tank car. Finally, Becco's accounting department and the railroad receive copies of the printed records. The scales used are inspected and tested four times a year, and no inaccuracies have ever been reported.

The weighing of tank trucks is handled with similar care to ensure accurate delivery, and a weight certificate is furnished to each customer.

So, the fishermen have their stories, and we have ours—and ne'er the twain shall meet!

MORE than a third of a century of experience shows! Ever since it was founded 36 years ago, Becco has devoted its time and energy to the manufacture of hydrogen peroxide and to research in its application. Today, Becco provides industry with 10 additional peroxygen chemicals based on electrolytically-produced hydrogen peroxide.

Becco serves many industries—textile, paper, plasticizers, cosmetics, metal finishing, and is even doing its share in the fields of missile guidance and propulsion. The broadened use of peroxygen chemicals owes much of its present state to Becco's Research and Development staff which continuously studies customers' needs in an effort to keep pace with today's—and tomorrow's—world.

The technical "know-how" of our chemists, engineers, and technical fieldmen is available to you. Their experience has been condensed in a series of technical bulletins. A few are listed at right. If you find any of interest, just drop us a line on your letterhead and ask for the ones you want by number. We'll be happy to oblige.

AVAILABLE TECHNICAL BULLETINS

Product Descriptions

1. ACTIVE OXYGEN CHEMICALS
2. HYDROGEN PEROXIDE
3. HIGHLY CONCENTRATED H_2O_2
4. PERACETIC ACID 40%
6. SODIUM CARBONATE PEROXIDE
7. ALKALINE EARTH METAL PEROXIDES
8. SODIUM PYROPHOSPHATE PEROXIDE
10. UREA PEROXIDE
11. POTASSIUM PERSULFATE
41. BECCO H_2O_2 35% HP
42. BECCO H_2O_2 35% FORMULA D
45. SODIUM PERBORATE
46. CONCENTRATED H_2O_2
49. AMMONIUM PERSULFATE
70. BECCO HYDROGEN PEROXIDE 98%

Properties, Reactions, etc.

24. ANALYSIS OF ALIPHATIC PERACIDS
34. USES OF PERSULFATES A BIBLIOGRAPHY—PART I
40. EQUIPMENT FOR USE WITH HIGH-STRENGTH HYDROGEN PEROXIDE
55. STABILITY OF PURE HYDROGEN PEROXIDE
59. THE ANALYSIS OF H_2O_2 SOLUTIONS
62. HYDROGEN PEROXIDE VAPOR
68. USES OF PERSULFATES A BIBLIOGRAPHY—PART II
87. THE BEHAVIOR OF THE GLASS ELECTRODE IN HYDROGEN PEROXIDE SOLUTIONS
93. ANHYDROUS HYDROGEN PEROXIDE AS A PROPELLANT

fmc
FOOD MACHINERY AND CHEMICAL CORPORATION

BECCO Hydrogen Peroxide

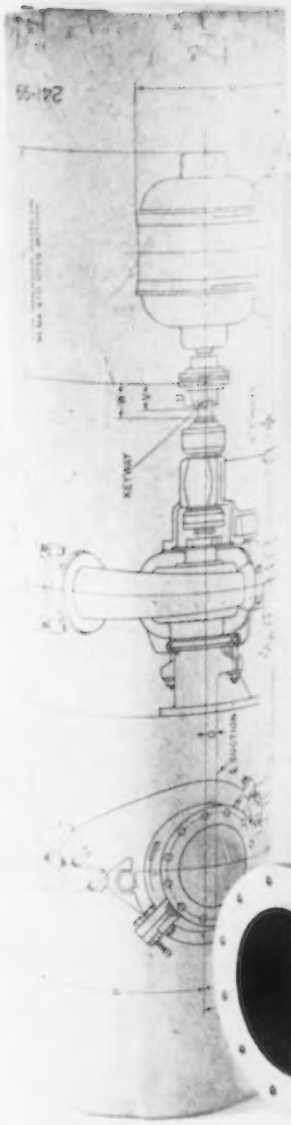
Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

Becco Chemical Division

General Sales Offices:
161 EAST 42nd STREET, NEW YORK 17, N. Y.

The pump that refuses to choke on paper stock!



What makes this pump virtually "plug-up" proof?

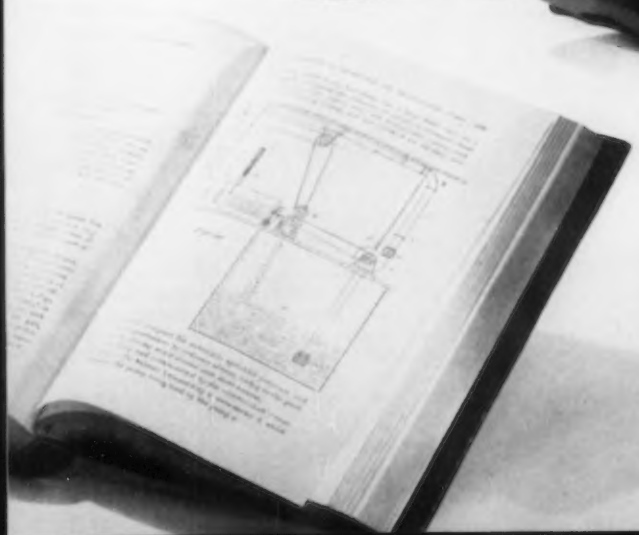
The answer is inside the pump. Because of its unique impeller, this Goulds Fig. 3135 gobbles up any practical consistency of stock without choking—24 hours per day!

The inlet vane tips of the impeller are warped to provide a "screw conveyor" effect. This causes stock to flow evenly through the impeller, preventing water separation.

Ejector vanes on the back wall of the impeller follow the curvature of the main vanes. This prevents the entrance and jamming of stock or other solid material between the back impeller wall and the stationary sideplate.

Capacities to 4000 GPM, heads to 215 feet. All the details are in Bulletin 723.1. Write to Goulds Pumps, Inc., Dept. SP-69, Seneca Falls, N. Y., for your copy.

GOULDS PUMPS



Prices of Fibers

MARKET WOOD PULP

SECOND QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	$90.00/ —	$90.00/ —	$90.00/ —
Bleached Gw'd.	97.50/100.00	97.50/100.00			
Kraft, Blchd.	‡140.00/150.00	‡140.00/150.00	150.00/ —	150.00/ —	150.00/ —
Kraft, Blchd. Hdwd.	135.00/140.00		140.00/ —		
Kraft, Semi-bleached.	130.00/140.00				
Kraft, Unbl.	117.50/125.00	125.00/ —	125.00/130.00	125.00/ —	
Sulphite, Blchd.	‡135.00/140.00	‡135.00/140.00	140.00/ —	140.00/ —	140.00/ —
Sulphite, Bl. Hdwd.	135.00/ —				
Sulphite, Unblchd.	125.00/ —	125.00/ —	125.00/ —	125.00/ —	125.00/ —
Sulphite, Unb'l. Gl'an.		140.00/ —	134.00/ —		
Soda, Blchd.	130.00/135.00	130.00/135.00			

‡ Depending on Brightness.

COTTON LINTERS

F.O.B. OIL MILLS PER CWT
WEEK ENDED JUNE 20

	Atlanta	Memphis	Dallas	Los Angeles
Grade 1	n.a.	n.a.	n.a.	n.a.
2	n.a.	n.a.	n.a.	7.50/7.00
3	$7.50/7.00	$7.50/7.25	$7.50/7.00	6.75/6.50
4	7.00/6.25	6.50/6.25	6.50/6.25	6.00/5.75
5	6.25/5.75	6.00/5.75	6.00/5.50	5.25/4.75
6	5.75/4.75	5.50/5.25	5.25/5.00	4.50/4.25
7	4.75/4.25	4.75/4.50	4.75/4.00	n.a.

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	June 26	June 26	June	June
No. 1 Mixed Paper	$ 7.00/ 9.00	4.00/ 7.00	6.00/ —	12.00/ —
No. 1 News	12.00/ 13.00	11.00/ —	11.00/ —	16.00/ —
Overissue News (Lg. size)	11.00/ 13.00	9.00/ 11.00	16.00/ —	18.00/ —
Mill Wrappers	19.00/ 22.00	9.00/ 11.00	9.00/ —	13.00/ —
Old Corrugated Containers	17.00/ 18.00	18.00/ 18.50	18.00/ —	16.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	28.00/ —	50.00/ —
New Double Kr. Ld. Corr. Cuts	27.50/ 30.00	30.00/ 32.50	30.00/ —	27.50/ —
(Semi-chem. medium)	45.00/ —	42.50/ —	42.50/ —	— / —
New 100% Kraft Corr. Cuts	40.00/ 42.50	— / —	52.50/ —	— / —
New Br. Kraft, Env. Cuts	65.00/ 70.00	65.00/ 70.00	47.50/ —	45.00/ —
New Br. Kr. Bag Waste Prntd.	50.00/ 55.00	50.00/ 60.00	47.50/ —	37.00/ —
New Br. Kr. Bag Waste Unprintd.	55.00/ 60.00	60.00/ 65.00	55.00/ —	45.00/ —
No. 1 Groundwood Shvs.	25.00/ 30.00	20.00/ 25.00	10.00/ —	27.50/ 30.00
White Newsblanks	42.50/ 45.00	35.00/ 40.00	30.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	55.00/ 60.00	50.00/ —	75.00/ —
Super Soft White Shvs.	65.00/ 75.00	70.00/ 80.00	60.00/ —	— / —
Hd. White Shvs.	75.00/ 80.00	80.00/ 90.00	75.00/ —	80.00/ —
Hd. White Env. Cuts	90.00/ 95.00	100.00/105.00	80.00/ —	103.00/ —
Col. Tab. Cards	40.00/ 42.50	40.00/ 42.50	40.00/ —	35.00/ —
Manila Tab. Cards	57.50/ 60.00	55.00/ 60.00	60.00/ —	65.00/ —
No. 1 Col. Ledger	32.50/ 35.00	30.00/ 35.00	35.00/ —	18.00/ —
White Ledger	45.00/ 50.00	47.00/52.00	45.00/ —	40.00/ —
Mixed Book & Mag.†	— / —	— / —	8.00/ —	— / —
No. 1 Books‡	15.00/ 17.50	18.00/ 22.00	22.50/ —	8.00/ —

† Includes Time & Life: no coarse groundwood. ‡ Not to exceed 10% of groundwood.

PJT NEW LITERATURE

Air-Operated Diaphragm Valves

Includes sectional drawings, descriptive information, tables of air actuator pressures for various line pressures, dimensional data, ordering instructions and other data for eight different types of air operators for diaphragm valves. Bulletin 134-A. Hills-McCanna Co., 400 Maple Ave., Carpentersville, Ill.

Engineering Catalog

Describes Extremultus flexible, oriented nylon-polymer core belting. Features comprehensive engineering and application data, including graphs to determine proper type belt, as well as charts for belt width and tension. 12 pp. Catalog. Extremultus, Inc., 130 Cooledge Ave., Englewood, N. J.

Pressure and Vacuum Gages

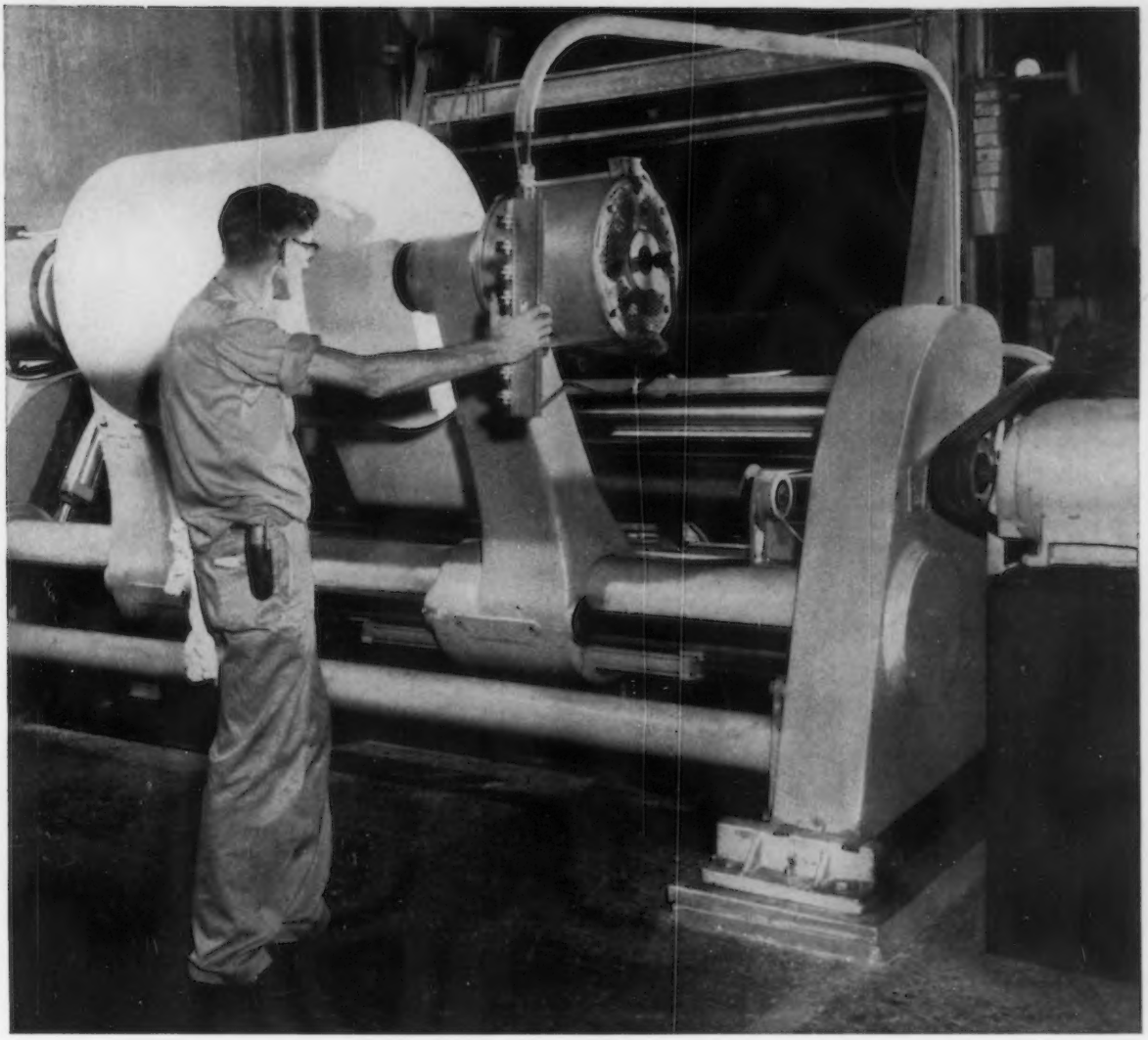
Describes Honeywell's instruments for measuring, indicating, recording, and controlling pressures and vacuums involved in industrial processes. Specifications and data on instrument types and control systems are presented in detail. Catalog C70-1a. Minneapolis-Honeywell Regulator Co., Wayne and Windrim Avenues, Philadelphia 44, Pa.

Stickle Differential Drainage Systems

Illustrates both two and three section systems, along with micro adjustable orifices, pneumatic diaphragm motor control valves, condensate receivers and flash tanks, wet end temperature controllers, vacuum pumps and control panels. Bulletin 360-A. Stickle Steam Specialties Co., 2215 Valley Ave., Indianapolis 18, Ind.

Steam Jet Blowers and Blast Nozzles

Describes complete SK line giving dimensions, weights and capacities for all sizes. Blowers use pressure steam or compressed air to move large volumes of air in ventilating and circulating applications. Nozzles are designed for use in ducts and stacks at very low



They threw out the unwind shaft and roll production jumped 50%

This is the magic of the Langston shaftless unwind stand. Put it in anywhere and right away you can get more production—and with actually less manpower.

Usually one operator can do everything—faster than two men with a shaft-type back stand. At Potlatch Forests, Inc., Lewiston, Idaho, for example, the operator can get a roll on the machine ready to unwind in about 60 seconds. All he does is maneuver the roll into position, push a button that closes the arms, another button to lift the roll into running position . . . and the job is done. No horsing a heavy shaft. No uncertain manual tightening of cones. No risk of slippage. Powerful hydraulic cylinders close the cones tight on the roll and hold them there automatically. He doesn't have to return rolls to the "broke beater" merely because of damaged cores or slow down the machine when unwinding out-of-round or narrow rolls.

Langston shaftless unwind stands can pick up rolls in diameters as small as 14 in. and as large as 84 in.—as narrow as 10 in. and as wide as 132 in. or more. Side register control, an optional extra, lets you unwind slipped (telescoped) rolls with a minimum of trim.

Economy is the big reason for today's trend toward these Langston shaftless unwind stands. Does economy interest you? Write for complete details. Samuel M. Langston Co., 6th & Jefferson Sts., Camden 4, N.J.

Langston LEADERSHIP . . . BY DESIGN

drafts. 7 pp. Bulletin 4AB. Dept. JA-34, Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.

Instruments and Controls

Describes fluid meters, transmitters and recorders, temperature instruments, plug-in components, Flamon detector, analysis instruments, Analog and Digital Systems. Bulletin G14-1. Bailey Meter Co., 1050 Ivanhoe Road, Cleveland 10, Ohio.

Syl-Off Silicone Coatings

Explains how silicone coatings impart excellent nonsticking or release characteristics to a variety of package liners, processing papers, interleaving and slip sheets; also how their use can save time and money, for manufacturers of stick products. Paper samples are included. Literature No. 8-605. Dow Corning Corp., Midland, Mich.

Nopco Wetting Agents

Suggests dozens of applications for wetting agents in the field of textiles, paper, metal processing, leather, protective coatings and a variety of specialized uses. Lists typical properties and descriptions. Bulletin ISP-45. Advertising Dept., Nopco Chemical Co., 60 Park Place, Newark 1, N. J.

Ply Bond Strength of Paperboard

Illustrates ply bond tester created to meet the need for additional physical testing of laminated products, gummed tape and other packaging materials requiring high strength. Specification Sheet. Testing Machines, Inc., 72 Jericho Turnpike, Mineola, N. Y.

Pneumatic Vibratory Feeders

Contains detailed drawings and applications. The feeders, featuring a patented "one-piece" simple design, are claimed to be lowest in original and operating costs. Catalog No. 308. National Air Vibrator Co., 435 Literary Road, Cleveland 13, Ohio.

Pneu-Pac Bulletin

Describes compact positive and negative pressure pneumatic systems for car, truck or bin unloading in both stationary and portable units. Gives dimensional information and capacity data. Bulletin 211-B. Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa.

Tremco Liqui-Mat

Describes a new approach to roof protective treatment with excellent weathering characteristics which protect vulnerable spots as well as the level surfaces. The Tremco Manufacturing Co., Cleveland Ohio.

NPA-FBA emergency headquarters. Front of farmhouse, shows entrance to underground shelter (center) and wind direction indicator atop chimney. Artificial hill gives added protection.

NPA& FBA Set Up Emergency Headquarters

The National Paperboard Ass'n. and Fibre Box Ass'n., recognizing the need for preparedness, maintain a joint national emergency headquarters which would be activated in event of nuclear attack. It is situated in a well equipped and protected shelter located in the Virginia countryside about 45 miles west of Washington, D. C. The shelter contains essential records, directories and other information which will be needed to carry on the work of the associations and their respective industries should the present headquarters become inoperative. These are the only trade associations known to have established relocation headquarters. Records and services of National Paperboard Ass'n., whose 92 members produce approximately 90 per cent of total U.S. output of paperboard and Fibre Box Ass'n. with 110 members producing about 80 per cent of the nation's corrugated and solid fiber shipping containers would be of great importance in a post-attack period.

The present headquarters of both associations are located in Chicago with offices in New York, Washington and San Francisco. If a major nuclear attack were made on the United States, it is assumed that the offices of the associations would be unable to function and complete authority would then be transferred to the emergency headquarters.

Product Reference File

Presents data on Formvar, polyvinyl formal Butvar, polyvinyl butyral, Gelvatol, polyvinyl alcohol, and Gelva, polyvinyl acetate, resins, emulsions and spray-dried powders. 12 pp. Booklet. Shawinigan Resins Corp., Dept. DP, Springfield 1, Mass.

Lubricated Plug Valves

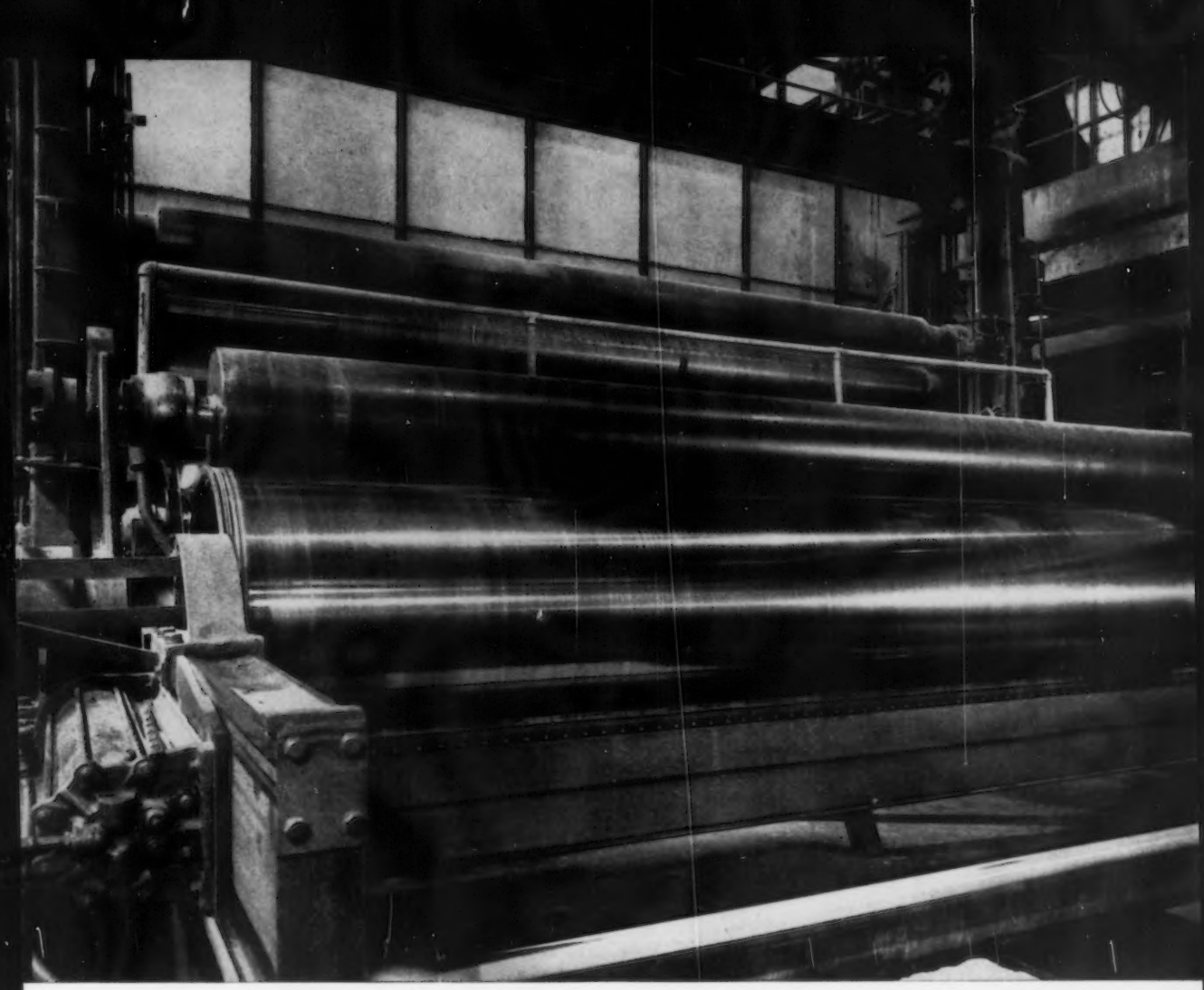
Lists 85 figure numbers from which the engineer may select data and calculate pressure drop with either the K-values or Equivalent Feet Method. Computations covered will fulfill most piping requirements. 12 pp. Bulletin. Walworth Co., Valves & Pipe Fittings, 750 3rd Ave., New York 17, N. Y.

R-P & C Valves

Includes illustrations with condensed descriptions and specifications on R-P & C bronze, iron body and cast steel gate, globe and angle, and check valves; bar stock valves, and forged steel gate valves. 16 pp. Catalog 10-B. R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.

Remote-Indicating Load Cell Systems

Illustrates uses throughout industry. Suggests ideas for new applications. Compares with conventional tube and circuitry designs. Covers 33 capacities from 0-100 lbs. through 0-1,000,000 lbs. Bulletin R-2. W. C. Dillon & Co., Inc. 14620 Keswick St., Van Nuys, Calif.



Unscheduled downtime can cost the average paper mill up to $4,000 an hour—or $60 a minute.

How to turn a $60-a-minute loss into an 8.8% profit

The answer? Install a Texaco "Stop Loss" Program. It can keep your machines and equipment properly lubricated at all times. As a result, they run better. Bearings and other parts last longer. Your paper machine runs at top capacity—with minimum production losses.

Other "Stop Loss" benefits include: reduced lubricant inventories, and purchasing costs. All told, this Program can cut your overall maintenance costs as much as 10%. These savings, in turn, can increase your net profits as much as 8.8%.*

How a "Stop Loss" Program works. Basically, a "Stop Loss" Program is concerned with modernizing and controlling lubrication practices—from purchasing right through actual application.

Professional Texaco lubrication engineers help specify the right lubricant and lubrication interval for every piece of equipment—from woodyard to machine shop. Particular attention is given to such paper mill problems as wet and dry end lubrication and water contamination. Lubrication responsibility is delegated . . . a fool-proof system of lubrication control is set up.

For full details on how a "Stop Loss" Program can fit into your operation and earn dividends for you, write:

Texaco Inc., 135 East 42nd St., N. Y. 17, N. Y. Dept. PT-42

**The U. S. Department of Commerce estimates that a paper mill doing a $10,000,000 yearly business will spend about $650,000 for maintenance. A 10% reduction in maintenance costs would amount to $65,000. Assume that profits average 7.34%—or $734,000. By adding the 10% maintenance saving, profits now total $799,000 . . . an 8.8% increase.

Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV

TEXACO

Throughout the United States

Canada • Latin America • West Africa

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

PJT NEWS OF SUPPLIERS

V. Jacobsen

L. G. Good

Ciba Co., Inc., has transferred Valdemar Jacobsen, sales representative, from the Philadelphia district to the New England district.

Mr. Jacobsen, a native of Denmark, graduated from a Copenhagen college in 1920 and came to the United States the same year. He started his career in the dyestuff industry in 1930 for a major manufacturer and during this time studied at the Philadelphia Textile Institute.

Systems Service Corp., Charlotte, N. C., has been formed by Louis G. Good, formerly vice president of Panellit Service Corp. The new company will be the sales representative for eight major industrial instrument product lines in the Carolinas and southern Virginia. Principals represented are Mason-Neilan, Annin Co., De/Var, Panalarm, Powertron-Ultrasonics, Daystrom-Weston, Barton Instruments, and Meriam.

Mr. Good is director of Instrument Society of America's Pulp and Paper Division. After graduating from Virginia Polytechnic Institute, Mr. Good was associated with Celanese Corp. of America, North Carolina Pulp Co., and the U. S. Army Engineers Corps.

Associated with Mr. Good in the new sales firm are William B. Simons, as vice president, and James Nisbet as secretary and treasurer. Both are owners of the Mec-Tric Control Co. and Carolina Controls.

Arabol Mfg. Co., one of the country's largest producers of industrial adhesives, has opened a new plant in Portland to service the Pacific Northwest.

The new facility is the 75-year-old company's ninth. Other plants are located in San Francisco, Los Angeles, New York, Chicago, St. Louis, Delaware, Ohio, Marietta, Ga., and Itasca, Texas. The firm's executive offices are in New York.

The Portland plant is under the direction of Spencer Tilden, the company's vice president in charge of the Pacific Coast Division, who maintains headquarters in San Francisco.

E. I. du Pont de Nemours & Co., Wilmington, Del., has appointed Francis L. Shackelford, Jr., manager of the Chicago district sales office of its Dyes and Chemicals Division, effective June 1.

Mr. Shackelford succeeds J. A. Turner who is retiring at the end of August after a career of more than 42 years with Du Pont. Mr. Turner will remain a consultant until his retirement.

Rodney Hunt Machine Co., Orange, Mass., has appointed George E. Soyka exclusive sales agent in Mexico for the Hunt paper mill rolls.

Dr. Soyka is affiliated with Manuel Del Castillo in the firm of Castillo y Soyka. From their office at Isabel La Catolica 45, Mexico (1) D. F., Mexico, Castillo y Soyka represents a number of American manufacturers in various Latin American markets.

For the past two years, Dr. Soyka has headed a pulp and paper industry consulting firm, George E. Soyka and Associates, with offices in Andover, Mass. Prior to entering the consulting field, he was technical director of Bolton-Emerson and the Pulp and Paper Research Center of Lawrence, Mass. He has held executive and technical positions in several paper mills.

The Industrial Rolls Division of Rodney Hunt manufactures a broad line of rolls of metal, wood, rubber and plastic for the paper industry, including breast rolls, table rolls, wire rolls, felt rolls, press rolls, etc.

Wm. E. Hooper & Sons Co., Baltimore, Md., announces that, effective July 1, its Dryer Felt Division will become a part of the Mount Vernon Dryer Felt Co.

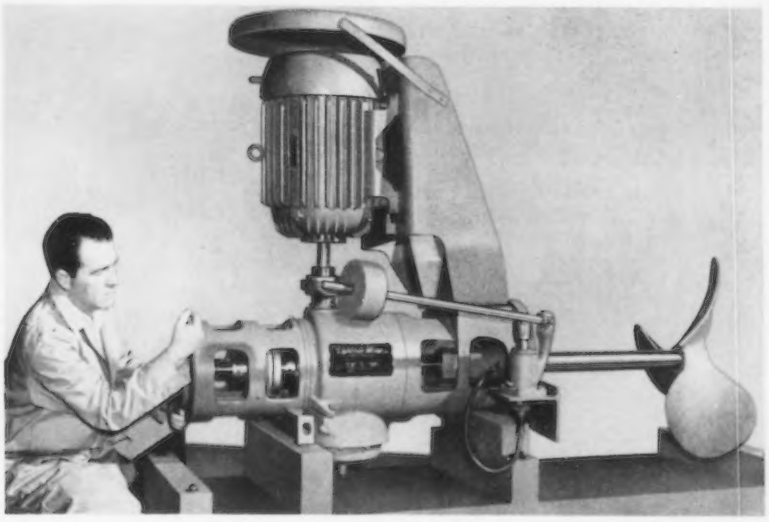
The Hooper mill in Baltimore, Md., will be operated by Mount Vernon as well as the mill in Columbia, S. C.

Dorr-Oliver, Inc., Stamford, Conn., has named Glenn O. Wilson to the newly created post of manager of the sales technical divisions of the international division, as part of a program aimed at further improving D-O service to customers in South America, Africa, and Asia.

Mr. Wilson has been with the organization since 1928, when he joined the Dorr Company Engineers, predecessor company to Dorr-Oliver, Inc., in their Denver, Colo., engineering department.

"And stop referring to it as the wet end!"

NEW EQUIPMENT & SUPPLIES



Side-Entering Mixers Offer 50 Percent More Capacity

Major innovations in side-entering mixer technology applied to fluid agitation in process industries have been incorporated in the Lightnin NSE mixer line announced by Mixing Equipment Co. The range of models is said to achieve 50 per cent greater flow or blending capacity while installation and operating costs are reduced by as much as 50 per cent in larger unit sizes.

Units in three basic sizes for applications ranging from one to 50 h.p. are offered compared to the previous limit of 25 h.p. Mixers are right-angle spiral bevel gear units with hollow quill speed reducers developed specifically for side-entering applications.

The addition of larger units to the side entering line, plus increased flow of these Hi-Flo mixers, permit substantial savings in initial investment, i.e.; a single 50 h.p. Hi-Flo side-entering mixer will do the job of three conventional 25 h.p. units; a Lightnin 20 h.p. unit will do more than the conventional 25 h.p. mixer; a 15 h.p. unit can now be used in most cases where 25 h.p. was previously required.

An auxiliary line of side-entering mixers (Series RSE) is also now available for installations not requiring the shock load protection afforded by hollow quill construction and independent bearing support, standard in the NSE line.

RSE side-entering mixers are manufactured in two basic sizes ranging from one to 25 h.p. Hi-Flo unit economies and advantages are identical to the NSE line.

Super pitch propellers offer improved hydraulic efficiency on both NSE and RSE mixers. The diameter of a super-pitch propeller is smaller than a comparable square pitch propeller, thus allowing installations of large low-speed mixers on conventional size manways. Mixing Equipment Co., Inc., 170 Mt. Read Boulevard, P.O. Box 1370, Rochester, N. Y.

Same Size Lift-Truck Battery Carries More Power

A line of Exide-Ironclad batteries, just introduced with an electrical capacity of 85 ampere-hours per positive plate, is said to provide the most power per cubic inch now available for electric industrial trucks.

The type TSC boosts the capacity of tubular-type-plate Exide-Ironclad batteries without any change in previous dimensions, including the critical height dimension of 22⅝ inches without battery tray cover.

More power is available in type TSC Exide-Ironclads because of design improvements that increase the amount of active material in the positive plates and increase the porosity of the square-shaped tubing that holds the active material at the grid spines.

The TSC Exide-Ironclad batteries are designed for use in many types of counterbalanced and stand-up, center-control and end-control fork lift rider-type trucks and in pallet-type and fork-lift hand trucks.

The batteries are available in eleven standard sizes—with from 11 to 33 plates per cell—in capacities ranging from 425 to 1360 a.h.

All capacity ratings of TSC Exide-Ironclad batteries are based on full initial capacity with 1.275 to 1.285 specific-gravity electrolyte. Industrial Markets Div., Electric Storage Battery Co., Adams Ave., Philadelphia 20, Pa.

Fractional H.P. Reducer With 25:1 Gear Ratio

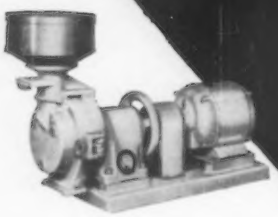
A fractional horsepower speed reducer, smallest in the Torque-Arm line, is being introduced by Dodge Manufacturing Corp., Mishawaka, Ind.

The unit, identified as TD025, has a gear ratio of 25:1 and will transmit up to .95 h.p. at maximum recommended output speed of 85 r.p.m. A predetermined combination of reducer and V-belt drive can provide any speed ratio up to 175 to 1.

As a shaft-mounted reducer it is equipped with a torque arm for simple adjustment of V-belt drive center distance. Overload relsease is optional. As a flange-mounted reducer, it can be bolted directly to the driven machine or supporting structure.

Standard TD025 reducers are

VERSATILE LABORATORY MILL



Here's a disc mill for your laboratory . . . to do miscellaneous grinding jobs of either wet or dry material; to refine cooked chips and knotter or screen rejects; to fluff dry pulp samples.

For details and bulletin on the Bauer Laboratory Mill, write us or call FAirfax 3-5501.

The Bauer Bros. Co.

HEADQUARTERS FOR PROGRESS

1758 Sheridan Ave. • Springfield, Ohio

CHAS. T. MAIN, INC.

ENGINEERS

PROCESS STUDIES, DESIGN, SPECIFICATIONS, CONSTRUCTION SUPERVISION

PULP AND PAPER MILLS

STEAM, HYDRAULIC AND ELECTRICAL ENGINEERING
REPORTS, CONSULTATION, VALUATIONS

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BOSTON, MASSACHUSETTS
CHARLOTTE, NORTH CAROLINA

Alvin H. Johnson & Co.

INCORPORATED

Consulting and Designing Paper Mill Engineers

415 LEXINGTON AVENUE
NEW YORK 17, N. Y.

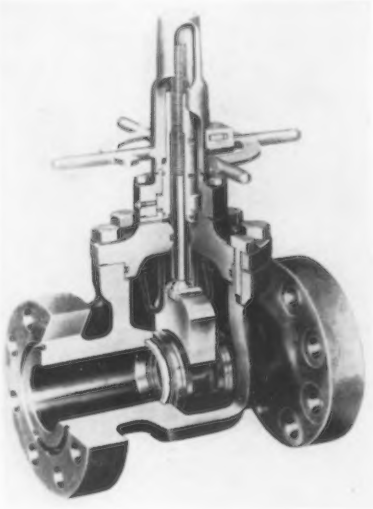
PAPER MILL DESIGN
PROCESS ENGINEERING
POWER PLANTS
STRUCTURAL & ARCHITECTURAL DESIGN
REPORTS
APPRAISALS
ESTIMATES AND SURVEYS

bored for mounting on 1¼ inch shafts, and bushings can be furnished to adapt for smaller shafts. A special TD025 bored for 1-3/16-inch shafts is also available.

The small reducer is of the same construction as others in the Torque-Arm line, with seals, semisteel housing designed to hold bearing seats in line for the life of the unit, and with helical gears and pinions supported between Timken tapered roller bearings and ball bearings.

Plastic-Coated Valve Handles Abrasive-Corrosive Fluids

Plastic-coated resilient-seat gate valves with high resistance to abrasion and corrosion have been introduced by Edward Valves, Inc., subsidiary of Rockwell Manufacturing Co. The steel valves are suitable for process piping where abrasive-corrosive liquids and slurries are handled.



The valves are available with screwed ends in 2-, 3-, and 4-inch sizes, rated 2000-lb. working pressure, 4000-lb. test or 3000-lb. w.p. (6000-lb. test). They are also available with flanged ends in the same sizes for 1440-lb. w.p. (ASA 600-series flanges) and 2160-lb. w.p. (ASA 900-series flanges).

Valve wear is largely confined to the seat insert and gate which can be replaced easily when necessary while the body remains in the line.

The gate is heat-treated chromium-molybdenum steel, ground smooth and hard-chrome plated. Seat insert is made of resilient Buna-N synthetic rubber integrally molded to steel rings. Maximum service temperature for the insert is 250°F.

The plastic coating, known as EValcoat, is a special formulation of phenolic, epoxy and other resins baked on the internal valve body surfaces. Field tests show that the coating resists undercutting and peeling even if it is mechanically broken.

Large unrestricted openings from the line into the bonnet cavity are designed to eliminate bonnet clogging in slurry service. Flow keeps the bonnet flushed free of loose particles. Edward Valves, Inc., Subsidiary of Rockwell Manufacturing Co., East Chicago, Ind.

H_2O_2 CONCENTRATION CONTROLLER detects instantaneously indicates, and automatically maintains a preselected concentration range of hydrogen peroxide which is variable to a considerable degree. Features include: easily adjustable concentration range to 2 per cent; minimum concentration range to 4 per cent of pre-set range; sensitivity to about 0.0001 per cent; continuous operation; 115 vac, single phase, 60 cps; 30 by 13 x 9 inches size. G. F. Bush Associates, Box 175, Princeton, N. J.

Expanding Sleeve for Winder Roll Shafts of Fiberglass

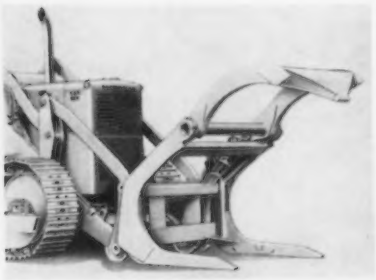
Nim-Cor, Inc., Nashua, N. H., manufacturer of Nim-Cor air shaft for mounting paper rolls on winding or unwinding equipment, announces the introduction of an expanding sleeve for use with the air shaft.

The expanding sleeve is made of custom laminated fiberglass and is used for coreless roll and narrow core operations. The sleeve is designed to fit any size shaft and comes in wall thicknesses of 1/16 to ½ inch, depending on the load capacity.

The lightweight sleeve has high spring-back action and is maintenance-free, according to the manufacturer.

Low Profile Pulpwood Fork Handles 16 Foot Logs

Low profile pulpwood fork that permits the Traxcavator 977H Loader to handle 1.72 cords of 16 foot logs averaging 4,500 lbs. per cord has



been announced by Caterpillar Tractor Co. Peoria, Ill. The fork can load 16-foot pulpwood, tree length pulpwood or sawed logs.

Design features include stop blocks that prevent bottoming of hydraulic cylinder pistons when the clamp is brought to a full-closed position. Clamp closure is 28.75 inches, which allows the fork to pick up tree length pulpwood and be held rigidly to prevent jackstrawing. Tines are 64.25 inches long, giving a clearance of eight feet, seven inches to tine tips at full dump position. The fork also is adaptable to the Series D and E Cat 977 Loaders.

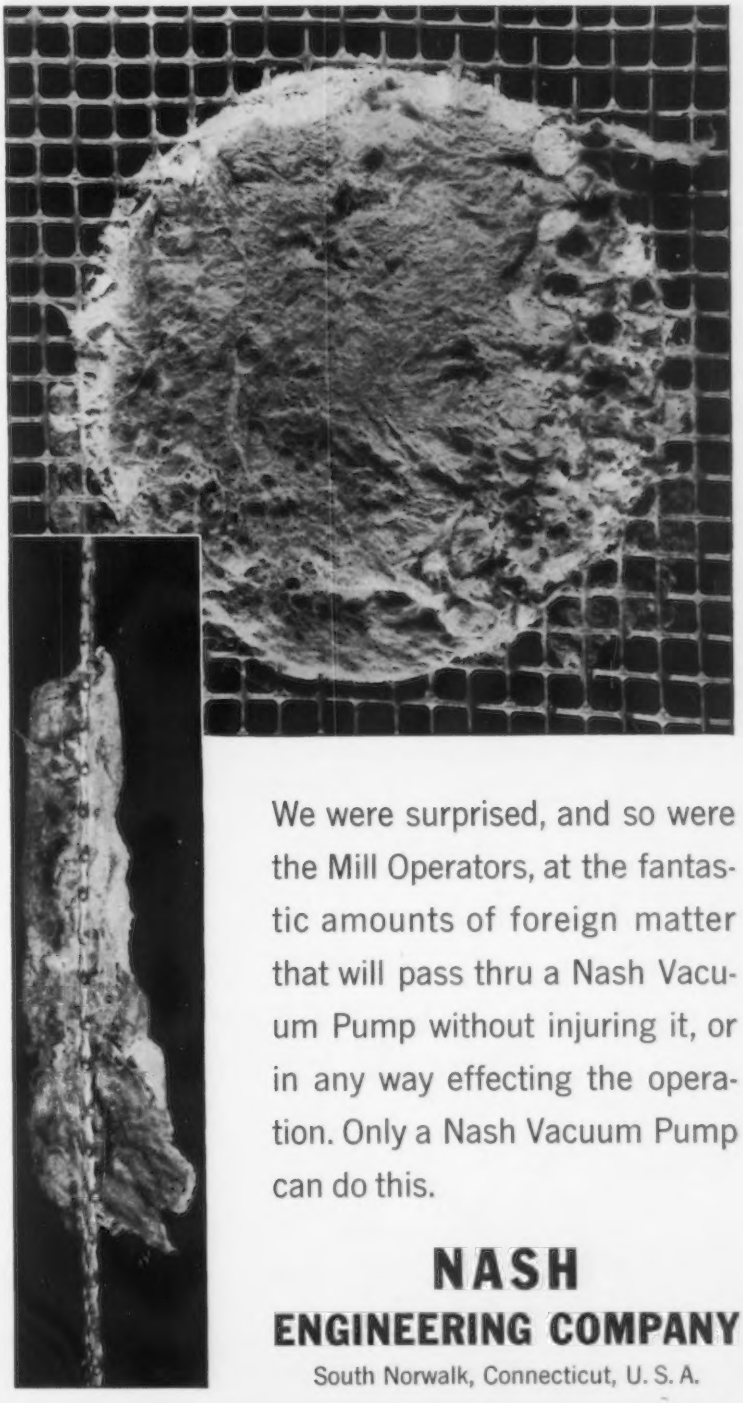
All Purpose End-Suction Centrifugal Pumps

A line of end suction centrifugal pumps, designed to meet the severe service requirements is being introduced by C. H. Wheeler Manufacturing Co. The pumps will handle oil, condensate, liquors and other process liquids, either clear or carrying suspensions.

The pumps, designated as type BHO, are offered in two sub-classes, Series 350 and Series 300, with 14 pump sizes, ranging from 1 to 5 inches, available in each series. The Series 350 pumps are offered in a variety of stainless steels and other corrosion resistant materials. Cast iron alloys and bronzes are employed in the Series 300 pumps which are designated for general process services.

Both series can pump liquids ranging in temperature from subzero to 350°F. up to 250° p.s.i. All sizes of Series 300, except the smallest, can be close-coupled, using standard motors with NEMA shaft extensions. Closure of the casing has been used for the Series 350 pumps.

We put a screen on the intake of a Nash Paper Mill Vacuum Pump for a few hours . . .



We were surprised, and so were the Mill Operators, at the fantastic amounts of foreign matter that will pass thru a Nash Vacuum Pump without injuring it, or in any way effecting the operation. Only a Nash Vacuum Pump can do this.

NASH
ENGINEERING COMPANY
South Norwalk, Connecticut, U. S. A.

Instead of the studs being drilled into the casing, they are welded directly to the casing.

Three volute discharge positions, upward, top horizontal and bottom horizontal, are available in both the 350 and 300 Series. The open faced type impellers permit adjustment for wear, and use an integral back ring to reduce stuffing box pressure and end thrust.

The pumps may be supplied with packing, or with either internal or external mechanical shaft seals. Deep stuffing boxes will accommodate five ⅜ inch rings of packing plus seal cage. Others accommodate six ⅜ inch rings of packing plus seal cage. Radial thrust, the shaft deflection at the face of the stuffing box is less than .002 inch.

Lubricated by the oil spray and partial immersion method, ball bearings are mounted in a cast iron housing with a large oil reservoir, the level of which is kept constant by an externally mounted leveler. C. H. Wheeler Manufacturing Co., 19th Street and Lehigh Avenue, Philadelphia 32, Pa.

OBITUARIES

John Mitchell Austin, 72, retired sales manager for Container Corp. of America, died June 10. Mr. Austin had been a resident of Houston, Tex., for 34 years.

Cyrus E. Roberson, 70, who had been employed by The Noble & Wood Machine Co. of Hoosick Falls, N. Y. for the past 52 years, died suddenly June 18 at his home in Hoosick Falls.

Mr. Roberson represented Noble & Wood for more than 40 years in various capacities in both sales and service throughout the United States and Canada.

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures
(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	May 20	May 27	June 3	June 10	June 17
1961	92.2r	92.7r	89.4	92.6	91.0
	May 21	May 28	June 4	June 11	June 18
1960	97.9	97.0	96.1	99.1	100.0

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	96.5	97.7	98.1	96.9	97.6	96.1	81.2	91.7	89.1	94.8	92.0	80.2	92.7
1961	87.9	90.0	91.2	91.2	91.6‡								

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1954	1955	1956	1957	1958	1959	1960	1961
Year to Date	93.5	97.2	101.3	94.8	88.0	92.6	97.5	90.5
Year Average	91.6	96.2	97.9	90.4	87.0	92.2	92.7	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	May 20	May 27	June 3	June 10	June 17
1961	93	93	84	94	92
	May 21	May 28	June 4	June 11	June 18
1960	95	93	85	96	93

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	92	95	94	93	94	92	78	94	88	93	86	73	89
1961	88	89	91	91	91								

† *Per cents of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	WEEK ENDING June 10, 1961	WEEK ENDING June 17, 1961	CUMULATIVE TO DATE Jan. 1, 1961 to June 17, 1961
% Activity	94%	92%	90%
Total	332,425	325,848	7,459,850
Containerboard—Domestic Use	160,739	167,840	3,774,773
Liner	107,265	111,317	2,514,605
Corrugating Material	48,489	50,966	1,142,247
Chip & Filler Board	4,985	5,557	117,921
Boxboard—Domestic Use	101,497	100,411	2,325,648
Folding	60,783	63,333	1,384,351
Set-Up	9,384	8,982	223,107
Special Food Board	31,330	28,096	718,190
Other Paperboard	70,189	57,597	1,359,429
Containerboard Type	36,968	28,596	645,659
Boxboard Type	33,221	29,001	713,770
Total Orders			
Received	351,827	303,272	
Unfilled End of Week	469,154	444,833	

Announcing . . . **a GREAT NEW SHEETER**

PreHi *by* **SMITH & WINCHESTER**

AMAZING SPEED plus ACCURACY

"Pre Hi"—your best buy

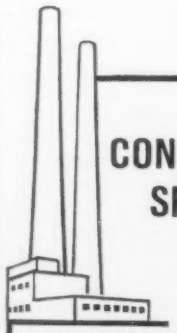
Straight line, balanced rolls, unique cutting zone assures high speed precision cutting. Extreme speed increases production . . . reduces labor costs and waste.

Unusual accuracy assures clean cut-off across entire width of paper. Clean cutting minimizes dusting.

Applications: Spot cutting to register from roll or printing presses • Single sheeting with electronic sorting • Multi-sheeting for high production.

SMITH & WINCHESTER
South Windham, Conn.

For more facts, write for bulletin 16PH Dept. P J



CONSTRUCTION SPECIALTIES

RUST

THE RUST ENGINEERING CO.
PITTSBURGH • BIRMINGHAM

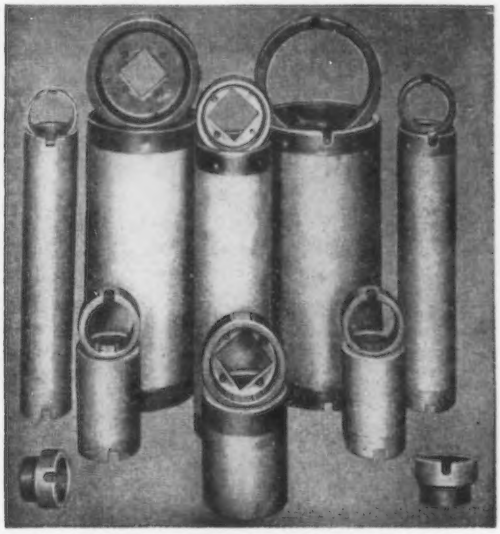
AMERICAN AND ENGLISH CLAYS

FOR ALL PAPER MAKING PURPOSES

ANGLO-AMERICAN CLAYS CORP.

(Formerly: English China Clays Sales Corporation)

6 East 45th Street, New York 17, N. Y.



ELIXMAN
CORES CAPS

Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.
CORINTH, N. Y.

BIG TANKS
...or small

quality-built to specifications

Kalamazoo
WOOD TANKS

Engineering experience, craftsmanship, selected top-grade tank lumber . . . your guarantee of satisfaction. For large tanks or small, see *Kalamazoo* first. Free estimates and suggestions.

WOOD TANK DIVISION

Kalamazoo TANK and SILO CO. 858 HARRISON STREET KALAMAZOO, MICH.

Jordan Shell and Plug Fillings

TRADE-MARK

POSITIVE

Reg. U. S. Pat. Off.

High Speed Disc Refiner

THE BAHR BROTHERS MFG. CO.
MARION, INDIANA, U. S. A.

Another Plant To Serve You

SHIP US IN KALAMAZOO

PACKING PLANTS
CHICAGO, ILL.
WASHINGTON, D. C.
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KALAMAZOO, MICH.
LOUISVILLE, KY.

THOMAS PAPER STOCK CO.
1500 N. Hooker St. MO-4-5700 Chicago 22, Ill.

PAPER TRADE JOURNAL

CLASSIFIED ADVERTISING RATES

HELP WANTED—$1.50 (6 words to line). Minimum charge $5.00.
SITUATIONS WANTED—$1.50. Minimum charge $5.00. If repeated ½ rate will be charged for each consecutive repetition.
FOR SALE—$1.50 a line. Minimum charge $5.00.
WANTED—$1.50 a line. Minimum charge $5.00.
OPPORTUNITIES—$1.50 a line. Minimum charge $5.00.

Classified Advertising is non commissionable.

Classified advertising space may also be purchased at $8.00 per single column inch. All classified advertisements are payable in advance. If box number is used—75 cents additional.

Address replies to advertisements appearing under Box Number in care of PAPER TRADE JOURNAL, 48 West 45th Street, New York 19, N. Y.

Help Wanted

PAPER MEN

$5,000 to $50,000

SALES • PRODUCTION • TECHNICAL

Finding and landing THE ONE BEST JOB requires sound analysis, careful planning, proper contacts and skillful negotiation.

Paper men ourselves, and the only recognized professional specialists in the world in our particular field, we assist responsible paper men to accelerate their careers by uncovering and developing THE SPECIFIC SITUATION that most exactly fits the needs of each individual we serve.

If you seek to better yourself, and your performance to date entitles you to our endorsement, we can and will help you. Contact us in absolute confidence for information regarding procedure.

GEO. M. SUNDAY & ASSO.

PERSONNEL CONSULTANTS TO THE PULP, PAPER & ALLIED INDUSTRIES

6 East Monroe, Chicago ANdover 3-1970

TF

MILL MANAGER WANTED

Requirements

Technical or engineering background
Ability to accept a tremendous challenge
Initiative, drive, and a personality that will inspire subordinates
Research and development oriented
Proven capability in line management
Some years experience in fine and technical papers

Compensation

Growth potential to satisfy the most ambitious
Excellent salary, bonus, and retirement plans
Location—Eastern Pennsylvania, with long established concern

If you are interested write all particulars to Box 61-135 c/o Paper Trade Journal for completely confidential handling of your inquiry.

J-24

PROCESS CHEMIST

For quality and process development and control: pulping, refining, sizing, formation, pressing, printing, packing and market place factors.

Location near Springfield, Massachusetts. Occasional travel to various division mills.

Graduate chemist or engineer with 2 or 3 years experience. Write in confidence to

Dr. H. E. Corwin
Div. Mgr., Mfg. Stds.
Molded-Packaging Division
DIAMOND NATIONAL CORP.
Palmer, Massachusetts

J-3

We're located in Wisconsin's Fox River Valley and have positions open for design engineers in an expanding organization.

We are looking for engineers and draftsmen with some mechanical or structural design experience, interested in applying initiative and design abilities on a variety of challenging engineering projects. This is a mill with a large integrated operation, with plenty of room for your personal growth.

Write to: Personnel Department, Thilmany Pulp & Paper Company, Kaukauna, Wisconsin.

J-3

ENGINEERS TECHNICAL SALES

We are seeking several engineers with pulp and paper industry experience interested in Technical Industrial Sales. Position requires sales contacts and engineering for handling systems and heavy equipment in the U. S. and abroad. Knowledge of dry end operations will be helpful. An engineering degree, or its equivalent in experience, plus an interest and ability to work with customers at upper levels of management are basic requisites. Must be willing to relocate to West Coast. Salary commensurate with experience. Resume should include complete personal and professional qualifications, present salary and photograph.

Reply Box 61-138 care Paper Trade Journal.

J-24

FIRST CLASS LAB MAN

for progressive tissue mill, desirable living area in upper New York State. Send resume and desired salary to Box 61-132 care Paper Trade Journal. J-17

COLLEGE TRAINED MAN FOR PAPER RESEARCH

Excellent opportunity in paper research and new products development. Prior experience in paper research desirable.

Send resume to: Personnel Department
P. H. GLATFELTER CO.
Spring Grove, Pa.
Phone—
Spring Grove 223-3216

J-3

CHEMICAL ENGINEER OR PULP AND PAPER SCHOOL GRADUATE

Excellent opportunity for chemical engineer or pulp and paper school graduate in development engineering phases of technical service and research. Some paper industry experience desirable.

Send resume to: Personnel Department
P. H. GLATFELTER CO.
Spring Grove, Pa.
Phone—
Spring Grove 223-3216

J-3

FOR SALE

BEATERS
2—1500 lb. rag beaters, Valley Iron, bandless rolls, 54″ x 48″, cast iron tubs

CALENDER STACKS
1—3 roll 84″ face
1—4 roll 72″ face (Extra heavy duty)
1—5 roll 86″ face

CHIPPERS
1—96″ Murray 4 knife Chipper—anti-friction bearings
1—84″ 10 knife Carthage Chipper, Anti-friction bearings, with motor

COATERS
1—27″ High Solid Coater
1—42″ Chapman Extrusion Type Coater

CRUSHER & HAMMERMILL
1—Murray Chip Crusher
1—Williams Hammermill
1—Jeffrey Shredder

CYLINDER MOLDS
5—36″ diameter x 75″ face, with couch rolls
1—36″ diameter x 82″ face
1—42″ diameter x 96″ face
2—42″ diameter x 106″ face
2—60″ diameter x 170″ face

DRIVES
1—Jones 21 H.P., ratio 10 to 1 (enclosed angle drive)
1—#4 Reeves Drive
2—Falk Drives, 20 H.P. & 160 H.P.
4—Falk Chest Agitator Drives, 10 H.P., ratio 140 to 1.

DRYERS
1—16″ diameter x 54″ face (steel)
1—28″ diameter x 84″ face
1—28″ diameter x 48″ face
4—28″ diameter x 40″ face.
2—Calender Dryers, bronze, 30″ x 128″ with frames, gears & necessary rolls to make up the unit.
1—36″ diameter x 44″ face
4—36″ diameter x 76″ face.
23—36″ diameter x 84″ face
14—48″ diameter x 48″ face with bearings
2—48″ diameter x 52″ face with frames, gears, bearings
2—48″ x 60″ face frames, gears & bearings
1—48″ diameter x 108″ face.
6—48″ diameter x 130″ face
1—60″ diameter x 92″ face, anti-friction bearings

EMBOSSING CALENDERS
1—43″ 3-roll Embossing Calender
1—48″ 2-roll Meadows Embossing Calender
1—51½″ 3-roll Smoothing Calender
1—57″ 3-roll Embossing Calender
1—62″ 2-roll Embosser
1—90″ 2-roll Smoothing Calender

FILTERS
1—Oliver, 8 ft. x 12 ft., rubber lined, complete
1—Oliver Filter 8 ft. x 8 ft.
1—Dorr-Oliver Filter, 3 ft. dia. x 6 ft. face, stainless steel construction, with pump

FLAT SCREENS
1—12 Plate "Packer"
4—14 Plate IMPCO, bronze vats

JORDANS
2—#1 Jones High Speed Jordans, Stainless steel tackle, A.-F. Bearings, motors.
1—#1 Jones High Speed Jordan
1—Jones Standard, new spare tackle, with 75 h.p. motor
1—Noble & Wood Mammoth Jr., with spare plug
1—Noble & Wood Baby Jordan, anti-friction bearings, with 20 h.p. motor
1—#6 Miami, anti-friction bearings

KNIFE GRINDER
1—70″ Seybold

LABORATORY EQUIPMENT
1—Washer for 5 lb. Beater
1—24″ Saveall, stainless steel
1—20″ Fourdrinier Wet End & Press Section
1—Noble & Wood Cycle Beater with motor & stand
1—Williams Freeness Tester.
1—Cady Micrometer
7—Mullen Testers, motorized & hand operated
1—2 qt. Auto Clave, Stainless Steel
2—Elmendorf Tear Testers.
1—27″ High Solid Coater
1—Noble & Wood Baby Jordan, anti-friction bearings, with 20 h.p. motor
2—Emerson, Jr., No. 1 Jordans, anti-friction bearings
1—24″ diameter x 24″ face Stainless steel Cooling Drum
1—8″ x 8″ Elmes Hydraulic Press

MISCELLANEOUS
1—Shartle Hydrafuge, 1000 g.p.m. (with motor)

MOTORS
4—25 h.p. Westinghouse, totally enclosed, ball bearing, 705 r.p.m.

PACKAGING MACHINERY
1—Lynch Morpac Packaging Machine

PRESSAFINER
1—7″ Pressafiner, stainless steel construction, New 1955, with new spare motor

PRESS ROLLS
2—Chilled iron, chrome plated 9″ x 72″
1—Chilled iron, chrome plated 10″ x 74″

PUMPS
1—Economy Fan Pump 6000 g.p.m. 20′ head, 50 h.p. motor

REELS
1—72″ Downingtown Reel, 2 bowl
1—84″ 3 bowl revolving reel
1—86″ 2 bowl reel
1—100″ Rice Barton 2 bowl reel, heavy duty
1—116″ Downingtown, 2 bowl, anti-friction bearings
1—123″ 3 bowl Revolving Reel
1—130″ Pope Reel (Rice Barton)
1—134″ 2 drum

REFINERS
1—Rice Barton Dynofiner, details on request
1—12″ Wiener Refiner, with 200 h.p. motor
2—36″ Bauer double disc #185E Refiners, each with two 100 h.p. motors
1—#4 Dilts Hydrafiner, anti friction bearings

ROLL HEADER
1—Valley Iron Roll Heading Machine, complete, for paper rolls 100″ long x 42″ diameter

ROLLS
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)

ROTARY SCREENS
4—#2A Bird Rotary Screens, copper vats
1—#2A—50 Bird, copper vat
2—APMEW Rotary Pulp Screens

SAVEALLS
1—#6 Bird Saveall.
1—24″ Continuous Saveall, stainless steel
1—LaMort 48″ diameter x 82″ face cylinder mold
2—Savealls, cylinder molds, 42″ diameter x 106″ face, brand new vats
1—Saveall, Rice Barton, cast iron vat, cylinder mold 48″ diameter x 128″ face, complete with 18″ diameter couch roll, all in very good condition

SHEETERS
1—160″ Moore & White, simplex, complete

SHREDDERS
1—16″ "Swift" Paper Shredder
2—Taylor Stiles Rag Cutters

SLITTERS & WINDERS
1—26″ Cameron Type 26-2A, with constant tension & electric eye.
4—42″ Cameron Type 6
1—42″ Cameron Type 9
1—42″ Cameron Type 26-2A
1—42″ Cameron Type 40-2
1—50″ Cameron Type 6
1—52″ Cameron Type 9.
1—86″ Two Drum Moore & White 50″ diameter rewind
1—96″ 4 drum Moore & White winder
1—64″ Waldron, Shear cut

SLITTING DEVICE
84″ Quick change slitting device shear cut, complete

SUCTION COUCH SHELL
1—Downingtown suction couch shell only. 127½″ face 26″ diameter

SUCTION COUCH ROLL
1—Beloit 36″ diameter x 246″ face, SKF bearings

SUCTION FELT ROLL
1—Gilbert & Nash 122″ face

SUCTION PRESS ROLL
1—Sandusky 18″ dia. x 138″ face Suction Press Roll

SUPER CALENDER STACKS
1—7 Roll 70″ face.

TOILET WINDERS
1—72″ Hudson-Sharp (Surface type winder)

TRIMMERS
1—95″ Seybold Trimmer, Model 15ZJ

VACUUM PUMPS
2—#3 Nash Hytors
1—#4 Nash Hytor
1—#7 Nash Hytor, with 75 h.p. synchronous motor
1—H-7 Nash
2—K-5 Nash
2—L-4 Nash
3—L-5 Nash
1—L-6 Nash

VATS
2—Brand new Downingtown Iron End Vats, for 42″ diameter x 112″ face cylinder molds. Will cut down to your size.

VIBRATING SCREENS
1—Hummer Vibrating Screen, Stainless Steel
1—Selectro, 2 Stage, 5 ft. x 10 ft.

WET MACHINES
1—84″ IMPCO Wet Machine

YANKEE DRYERS
1—60″ diameter x 92″ face, anti-friction bearings
1—12 ft. diameter x 181½″ face

Paddy Ross, Pres.

J. J. ROSS COMPANY

377 Frelinghuysen Ave. **Tel.—Bigelow 3-3720** **Newark 12, N. J.**

WANTED

A TOP FLIGHT OPERATING MAN, WELL ORIENTED TECHNICALLY AND WITH AMBITIONS TO EXPLORE NEW VISTAS OF PAPERMAKING, TO HEAD UP MANUFACTURING OF WHAT MAY BECOME THIS COUNTRY'S LEADING TECHNICAL SPECIALTIES OPERATION

INITIALLY AS

MILL MANAGER OF ONE SPECIALTY MILL TO $20,000 START

Plus Profit Sharing Bonus, Really Valuable Stock Options, Maximum Fringe Benefits, Etc.

AND SUBSEQUENTLY AS

DIVISIONAL MGR. OF MANUFACTURING OVER SEVERAL SPECIALTY MILLS

Client company, long identified with our industry and one of the nation's most fabulously successful pioneers of new products, has launched a program of specialty mill acquisition and development designed to put them in the vanguard of the technical specialties field.

Looking toward the near future, when they will be operating additional facilities and running many grades not hitherto manufactured. Client has commissioned us to join to its staff an outstandingly capable operating executive in the 35-45 age range, preferably specialty backgrounded, to take full charge of their present mill and, as other properties are acquired, to assume overall manufacturing responsibility.

Needed here is an ingenious, versatile, creative manufacturing expert with a pioneering spirit — a profit conscious, highly adaptable fellow of strong innovational bent who can and will make machines and processes do new things — an openminded yet decisive "imagineer" who has long since stricken the word "impossible" from his vocabulary.

Man selected will have at his command a world of technical assistance, and will work hand in glove with one of the greatest R. & D. teams that has ever been assembled by private industry in this country. As new grades are developed, it will be his job to figure out ways and means of manufacturing them to maximum advantage.

This is the most interesting and challenging management opportunity with which we have been concerned in some time — a chance to head up the manufacturing side of a large scale program to open up new vistas of papermaking. With virtually unlimited financial and scientific resources behind him, the trailblazer who enters this picture at this time can become a factor of real significance in our industry's future.

Present candidacy by duplicate letter to Mr. George M. Sunday personally in full confidence, enclosing two pictures and two copies of comprehensive resume covering vital statistics; education; social, religious and professional affiliations; and detailed chronological treatment of business background and experience, including present and past income levels. Telephone conference will follow, at which time cogent details will be revealed and arrangements made for initial, exploratory interview with client principals.

SUNDAY, INC.

Personnel Consultants to Management
Pulp, Paper, Packaging and Allied Industries

6 East Monroe Street **Chicago 3, Ill.** **ANdover 3-1970**

J-3

. . . WANTED . . .

R. & D. CHEMIST

with Strong Background in

PAPER TECHNOLOGY

and Interest in Chemical Applications to Paper, Films, Foils, Etc.

TO $10,000 START

Plus Liberal Profit Sharing and Bonus

Our client, a leading Midwest chemical company internationally known in the field of volatile corrosion inhibitors, is expanding the new product development program of its industrial division to broaden the base of its activities in the area of the application of coatings and impregnations to paper, film, foil, laminates, etc.

Though very well staffed with organic chemists in its other divisions, Client company does not now have a technician with paper background. The new man will be the expert in this area, with a strong voice in the directionalizing of R. & D. activities involving paper and similar substances.

Client company thinks basically in terms of patentable applications and products—and liberally rewards its R. & D. people for development of saleable items. Accordingly, this position offers tempting financial potentials to a creative-minded paper chemist capable of developing commercially feasible applications of chemicals to flat, flexible materials.

Make initial inquiry in duplicate to Mr. George M. Sunday personally, enclosing two pictures and two copies of comprehensive resume detailing vital statistics; education; social, religious and professional affiliations; and chronological treatment of professional and/or business background and experience. Full confidence guaranteed.

SUNDAY, INC.

Personnel Consultants to Management
Pulp, Paper, Packaging & Allied Industries
6 E. Monroe St. Chicago 3 AN 3-1970

J-3

WANTED

PULP MILL SUPERINTENDENT—Desire a man experienced in semi-Chemical pulping. Please send a complete resume and a recent photograph to Mr. T. Casson; Plant Superintendent; Stone Container Corp, Coshocton, Ohio.

J-3

Situations Wanted

PULP MILL SUPERINTENDENT or Technical Superintendent—bleached Kraft. Ten years in control, research and production. Address Box 61-136 care Paper Trade Journal. J-10

TOUR FOREMAN available. Twenty nine years experience folding Box Board. Address Box 61-124 care Paper Trade Journal. J-17

Pulp and Paper graduate with 2½ years mill experience desires opportunity in technical service or production. Age 26. No geographical preference. Address Box 61-123 care Paper Trade Journal J-3

FOR SALE

JORDANS

1—No. 6 Morden stock maker, fillings like new complete with motor.

1—Noble and Wood Pony Monarch Jordan, precision type stainless steel fillings, type D in A1 condition.

1—E. D. Jones Jordan No. 315 with stainless steel fillings in plug, bronze in shell.

1—Emerson Jordan No. 2 with good fillings.

DRYERS

5—Downingtown dryers 36" dia. 72" face, A.S.M.E. tested and stamped for 50# steam.

16—Dryers, 60"x160" face taken from a paper machine running 1200 ft. per minute.

17—Dryers 28" dia. x 63" face.

35—Dryers 36" dia. x 82" face complete with frames, gears, bearings and rope carriers.

30—Dryers 36" dia. x 84" face.

BEATERS

6—E. D. Jones beater rolls, 54" dia. x 48" face, 70 new 304 stainless steel bars.

1—Beater roll 52" dia. x 48" face, 70 bars.

1—Beater roll, 54" dia. x 54" face, 66 bars.

2—Beater rolls, 60" dia. x 60" face, 76 bars.

All the above beater rolls can be filled with stands and tubs to make a complete unit.

WASHERS

7—complete washers, drum size 42" x 44" with bronze ends, complete raising and lowering mechanism.

SHEETERS AND WINDERS

1—Hamblet sheeter, 72" with 4 top and 4 bottom slitters and layboy.

1—Pusey and Jones two drum winder 132" face in A 1 condition.

1—Cameron winder No. 6—45" wide.

1—Dietz slitter perforator 81" for toilet tissue.

REELS

1—Black Clawson uniform speed reel equipped with a 42" dia. x 160" face drum, 4 mandrels, Hannifin air cylinders and air controls. A1 condition.

1—Bagley and Sewall pope type reel 110" face with anti-friction bearings.

1—2-spool 108" Pusey and Jones upright type reel.

2—90" Bagley and Sewall 2 spool reels.

1—2 spool 76" Sandy Hill upright type reel.

We specialize in manufacturing new horizontal Pope type reel, (no fancy name) just a well designed custom built reel at a realistic price.

CALENDER STACKS

1—7 roll calendar stack, 1 roll 18" dia. 104" face; 1 roll 16" dia. x 104" face; 5 rolls 12" dia. x 104" face.

1—8 roll calender stack, 1 roll 18" dia. x 86" face; 1 roll 16" dia. x 86" face; 2 rolls, 10" dia. x 86" face; 2 rolls 11" dia. x 86" face with anti-friction bearings.

1—4 roll calender stack, 1 roll 18" dia. x 102" face; 3 rolls 12" dia. x 102" face.

1—4 roll calender stack, 1 roll 18" dia. x 62" face; 3 rolls 15" dia. x 62" face.

SCALES

1—Toledo continuous Auto-check scale for 84" paper machine.

1—Toledo continuous Auto-check scale for 65" paper machine. These scales will give a continual indication of the weight of a lineal unit of sheet of material while in the process of manufacture.

OSBORNE PAPER MILL EQUIPMENT CORPORATION

Fulton, New York **LY 2-4254**

J-3

For Sale

FOR SALE
LOW PRICES

2—86" B. & S. Wet Machines; Bronze and Rubber Press Rolls; A.F. Bearings on Couches and Cylinder Molds. Complete with Gear Drives. Excellent Condition.

RUDERMAN MACHINERY EXCHANGE
Gouverneur, New York
Phone 333-334

TF

SHREDDERS for sale—Two large rebuilt Taylor-Stiles shredders. Address Box 61-128 care Paper Trade Journal. J-3

FOR SALE
ROSS CYCLE CONDITIONER FOR PAPER—USED

Designed to condition paper weighing 23 lbs/1000 sq. ft. from 36" to 45" wide at a speed of 500 feet/min. The paper enters the conditioner at a maximum of 100° F. containing 4 per cent moisture and leaves with 7½%±½%.

This machine must be sold in near future. Further details available on request. Inspection encouraged.

Box 61-122
care Paper Trade Journal

J-3

FOR SALE

Sparkler pressure leaf filter, with 10 stainless leaves, internal vibrator and motorized solids discharge conveyor. 100 GPM capacity, tank is Plastisol lined. Original cost $4,010.00. Will consider any reasonable offer. Full details on request. Address Box 61-134 care Paper Trade Journal.

J-10

Wanted

WISH TO PURCHASE a Paper Converting Plant on the west coast. Furnish full particulars. Address Box 61-137 care Paper Trade Journal. J-3

Government Bids

PROPOSALS
FOR FURNISHING

PAPER AND ENVELOPES FOR THE U.S. GOVERNMENT PRINTING OFFICE

SEALED PROPOSALS will be received until 10 a.m. E.D.S.T. July 11, 1961, in the room of the Join Committee on Printing, in the Capitol, Washington, D.C., for furnishing the paper for the public printing and binding, and blank paper and plain envelopes for the use of the Government departments and establishments in the District of Columbia, for the terms of 3 months for paper and 6 months for envelopes beginning August 1, 1961, deliveries to be f.o.b. Government Printing Office Warehouse, or warehouse siding, Washington, D.C. The proposals will be opened in the presence of and the award of contracts made by the Joint Committee on Printing to the lowest and best bidders for the interest of the Government whose bids are in conformity with the requirements of the proposals. The committee reserves the right to reject any or all bids, or to accept any bid or any part and reject the other part, if, in its opinion, such action would be in the interest of the Government.

Blank proposals containing the instructions, schedule, and specifications may be obtained by addressing James L. Harrison, Public Printer, Washington, D.C.

Contracts will be entered into for supplying the quantities required, whether more or less than the estimates as provided in paragraph 26 of the proposal for paper and paragraph 26 of the proposal for envelopes.

The approximate estimated quantities set forth in detail in the schedule comprise:

PAPER

1,365,000 sheets index paper, suitable for offset; 565,000 pounds index paper, suitable for offset; 80,000 pounds 100% index paper, suitable for offset; 490,000 pounds antique-finish cover paper, suitable for offset; 50,000 pounds litho-coated cover paper; 5,000 sheets cloth-lined cover paper; 25,000 pounds manila paper; 196,000 pounds kraft paper; 370,000 sheets gummed paper; 35,000 pounds blotting paper; 9,000 pounds oiled manila tympan paper; 40,000 pounds manila tag board; 15,000 pounds wallet board; 10,000 pounds jute tag board; 20,000 pounds manila cardboard; 72,000 sheets railroad board; 190,000 pounds board, tan and/or blue; 3,175,000 pounds postal card paper; 40,000 sheets pressboard; 210,000 pounds newsboard; 260,000 pounds book cover board.

The approximate estimate quantities set forth in detail in the schedule comprise:

2,265,000 pounds machine-finish book paper; 30,000 pounds machine-finish book end paper; 110,000 pounds english-finish book paper; 12,388,900 pounds offset book paper; 320,000 pounds antique book paper, suitable for offset; 100,000 pounds super-calendared book paper; 1,763,000 pounds coated book paper; 963,600 pounds mimeograph paper; 529,000 pounds duplicator copy paper; 1,780,000 pounds writing paper; 7,659,500 pounds writing paper, suitable for offset; 2,500 pounds 100% writing paper; 321,775 pounds map paper; 308,600 pounds manifold paper; 1,803,000 pounds bond paper, suitable for offset; 100,000 pounds translucent bond paper, suitable for offset; 300,000 pounds mimeograph bond paper; 2,000 pounds 100% parchment deed paper, suitable for offset; 915,000 pounds ledger paper, suitable for offset; 30,000 pounds 100% ledger paper, suitable for offset.

ENVELOPES

The approximate estimated quantities set forth in detail in the schedule comprise:

37,540,000 kraft; 17,630,000 writing, chemical wood; 200,000 100% writing, white; 760,000 25% bond, white.

By direction of the Joint Committee on Printing.

JAMES L. HARRISON,
Public Printer.

WASHINGTON, D.C.
June 20, 1961.

J-3

Help Wanted

ELECTRICAL ENGINEER

Multi-plant pulp and paper mill requires graduate electrical engineer with 2-4 years industrial experience for diversified electrical engineering staff position. Excellent opportunity for growth and development in expanding company and pleasant community.

Send resume of experience to Employment Manager
Union Bag-Camp Paper Corporation, Camp Division
Franklin, Virginia

J-10

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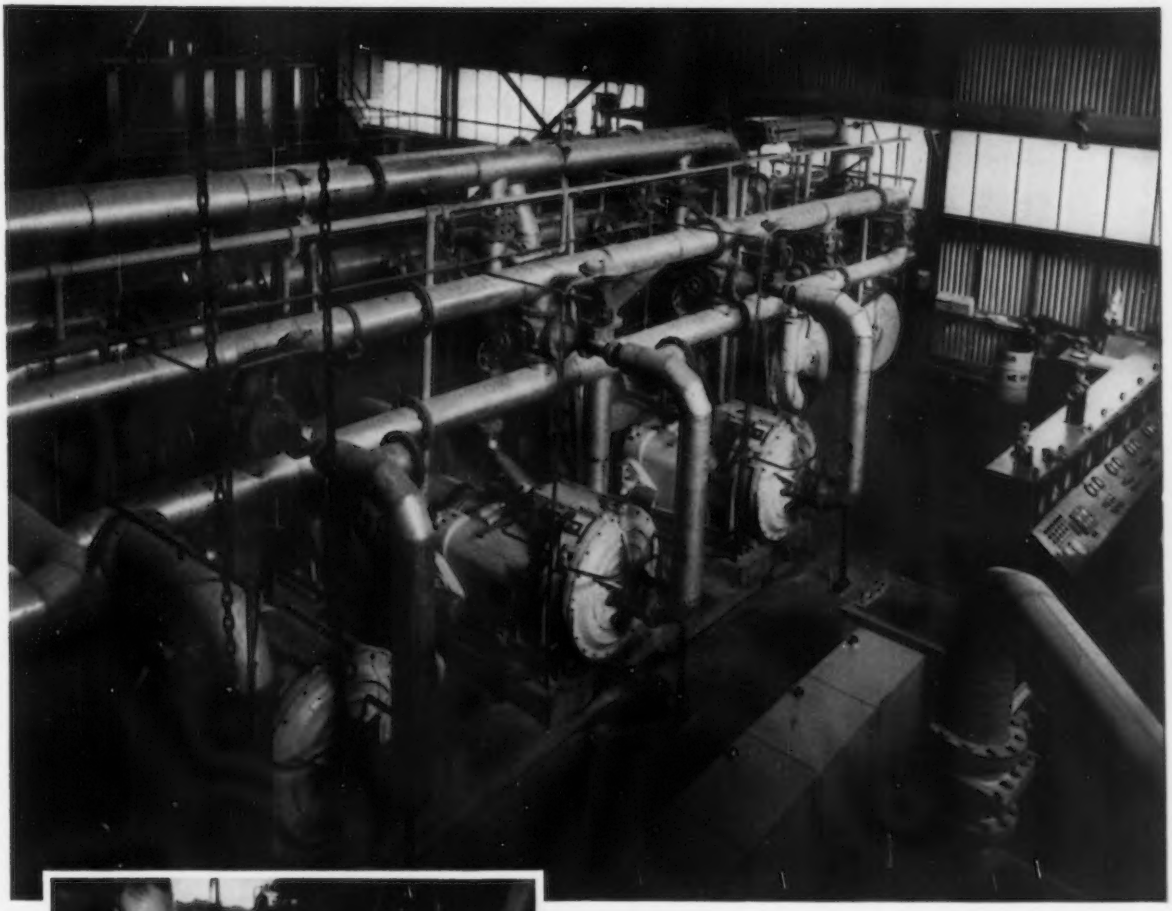

After two years of tough work Jones Double-D Super-Stainless discs show only .065" wear — evenly distributed and with parallelism perfectly retained.

for Jones Double-D's on the Seminole Chief

Sept. 7, 1957 was the day St. Regis began to produce their fine quality Seminole Chief Board in Jacksonville — with the help of ten Jones Double-D's for both primary and secondary refining. Regular six month checks of the Jones Super Stainless discs in each Double-D show a maximum wear of only .0027" per month. Applied against the available disc wear of .750", this actually indicates a disc life of more than 23 years!

This fine record has been made, too, under heavy power requirements — normally more than 600 HP and sometimes running as high as 1000 HP on each primary refiner for periods of several weeks!

Have a tough refining problem? Better look into the Jones Double-D. Write to E. D. Jones Corporation, Pittsfield, Mass., for bulletin EDJ1083.

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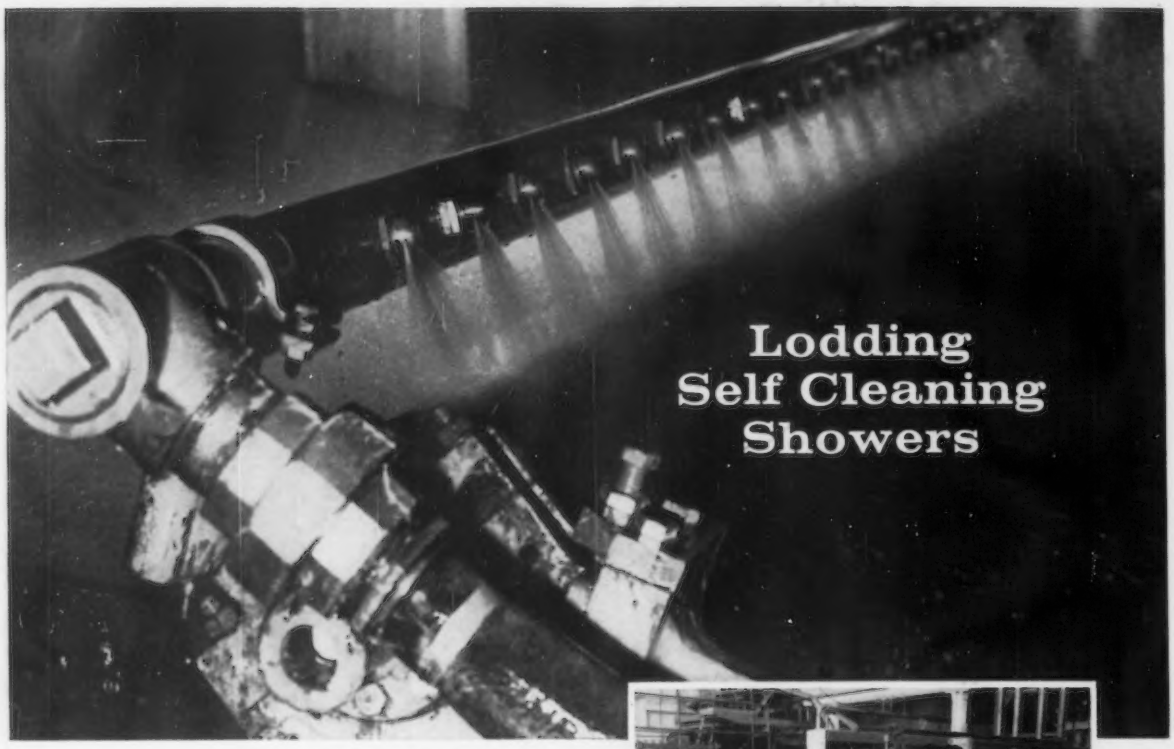
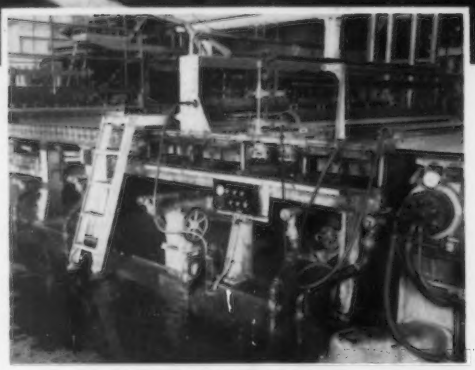
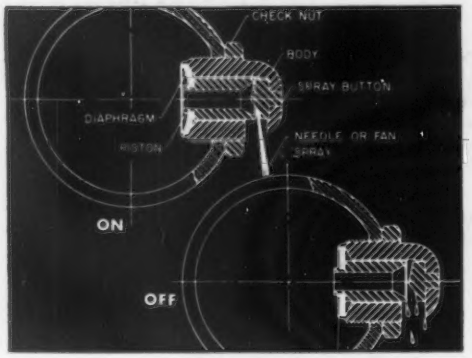


. . . tried and proved at Byron Weston Company

Efficient and economical – that's the verdict reached by Byron Weston Company after operating six Lodding Self Cleaning Showers on the Fourdrinier of its new No. 3 machine, producing both fine and heavy-weight papers. They out-perform conventional showers under difficult conditions of long fibered stock and conserve stock, heat and water.



Operating on clarified white water at a line pressure of 75 psi, the Lodding Showers at Byron Weston Company deliver overlapping, fan-shaped sprays that eliminate the need for oscillation. The recirculated white water enables fibers to be recovered, assuring minimum dilution of stock. Inlet pipes and simple "T" connections were the only requirements for installation.



Lodding Self Cleaning Showers have been tried and proved in *many* mills – in a wide variety of applications, under various operating conditions. They are engineered to give you the greatest possible showering efficiency, whether your system operates on fresh or clarified white water. This efficiency results from the exclusive design of the Lodding Nozzle.

In operation, water pressure forces the built-in, sealed piston against the spray button, which is precision milled to create the exact spray pattern desired – from an 80° fan to a needle stream. If foreign particles lodge in the nozzle, the piston oscillates and removes them. Other advantages of Lodding Self Cleaning Showers are explained in Bulletin No. 5902, a copy of which will be sent to you on request.

LODDING
Engineering Corporation
AUBURN, MASSACHUSETTS